

Paolo Boffetta, M.D.

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UNITED STATES DISTRICT COURT  
WESTERN DISTRICT OF WISCONSIN

-----x

KILTY,

Plaintiff,

vs.

WEYERHAEUSER COMPANY, et al.,

Defendant.

Case No. 3:16-CV-000515

-----x

SPATZ,

Plaintiff,

vs.

WEYERHAEUSER COMPANY, et al.,

Defendant.

Case No. 3:16-CV-000726

-----x

DEPOSITION OF PAOLO BOFFETTA, M.D.

New York, New York

Tuesday, February 6, 2018

Reported by: David Henry

Paolo Boffetta, M.D.

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<p>1 2 3 February 6, 2018 4 9:15 a.m. 5 6 7 Deposition of PAOLO BOFFETTA, M.D. 8 held at the offices of Segal McCambridge 9 Singer &amp; Mahoney, Ltd., 850 Third Avenue, 10 New York, New York, pursuant to Notice, 11 before David Henry, a Certified Court 12 Reporter and Notary Public of the State 13 of New York. 14 15 16 17 18 19 20 21 22 23 24 25</p>	<p>1 PAOLO BOFFETTA, M.D., 2 called as a witness, having first been duly 3 sworn, was examined and testified as 4 follows: 5 EXAMINATION BY MR. FINCH: 6 Q. Good morning, Dr. Boffetta. How 7 do you pronounce your name in English? 8 A. Boffetta. 9 Q. Boffetta, okay. I'll try to 10 remember to do that, but I grew up in 11 Virginia, so I may not get it right. I'm 12 not Italian. As you learned off the 13 record, my name is Nate Finch and I 14 represent the Kilty and Spatz families in 15 litigation against Weyerhaeuser and the 3M 16 Company. You have had your deposition 17 taken before, I take it? 18 A. Yes, a few times. 19 Q. So you understand the procedure 20 is that I get to ask you questions, and my 21 questions and your answers are recorded by 22 the court reporter? 23 A. Yes, I understand this. 24 Q. If you don't understand one of my 25 questions, could you let me know and I'll</p>
Page 3	Page 5
<p>1 A P P E A R A N C E S: 2 3 MOTLEY RICE, LLC 4 Attorneys for Plaintiffs 5 401 9th St. NW, Suite 1001 6 Washington, DC 20004 7 BY: NATHAN D. FINCH, ESQ. 8 9 10 FORMAN WATKINS &amp; KRUTZ, LLP 11 Attorneys for Defendant Weyerhaeuser 12 210 East Capitol St., Suite 2200 13 Jackson, MS 39201 14 BY: C. MITCH McGUFFEY, ESQ. 15 16 17 SEGAL McCAMBRIDGE SINGER 18 &amp; MAHONEY, LTD. 19 Attorneys for Defendant 3M Company 20 850 Third Avenue, Suite 1100 21 New York, NY 10022 22 BY: JENNIFER L. BUDNER, ESQ. 23 24 25</p>	<p>1 try to fix it or rephrase it and make it 2 more understandable? 3 A. Yes. 4 Q. And if you do answer one of my 5 questions, I'm going to assume you 6 understood it, is that okay? 7 A. Yes, it is. 8 Q. Your first language is Italian, I 9 take it? 10 A. Yes, that's my mother tongue. 11 Q. But you're very fluent in 12 English? 13 A. Yes, I think so. 14 Q. You're fluent enough in English 15 that when I start asking you questions 16 about epidemiological studies that you have 17 participated in or written about in the 18 literature, you can understand that in 19 English and convey information to me in 20 English? 21 A. Yes, I think so. 22 Q. If there is any point in time 23 when you think that you can't answer one of 24 my questions in English, let me know that 25 and we'll figure out a way to deal with it.</p>

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<p style="text-align: right;">Page 6</p> <p>1 Hopefully that won't happen, but we'll try.</p> <p>2 A. Okay.</p> <p>3 Q. What is your current rate for</p> <p>4 testimony?</p> <p>5 A. I think I charge \$450 per hour.</p> <p>6 Q. And is there a minimum for like a</p> <p>7 half day or a day or something like that?</p> <p>8 A. No, I usually charge by the hour.</p> <p>9 Q. \$450 for an hour. Do you also</p> <p>10 charge \$450 per hour for any work that you</p> <p>11 do such as reviewing materials and putting</p> <p>12 together a federal expert witness report?</p> <p>13 A. Yes, usually that's what I do.</p> <p>14 Q. And my understanding from counsel</p> <p>15 for Weyerhaeuser is that at the conclusion</p> <p>16 of today's deposition you will prepare an</p> <p>17 invoice for the time we spend here, and</p> <p>18 then you'll send it to him and he'll send</p> <p>19 it to me and we'll compensate you for the</p> <p>20 time. Is that your understanding?</p> <p>21 A. That's what he told me, yes.</p> <p>22 (Exhibit 1, Notice of Deposition,</p> <p>23 marked for identification.)</p> <p>24 (Exhibit 2, Subpoena, marked for</p> <p>25 identification.)</p>	<p style="text-align: right;">Page 8</p> <p>1 Weyerhaeuser?</p> <p>2 A. Yes, I did, last week I think.</p> <p>3 Q. And there are a few things out of</p> <p>4 that I will have questions for you about,</p> <p>5 but is there anything that you reviewed or</p> <p>6 considered for purposes of the Kilty and</p> <p>7 Spatz case in your testimony in that case</p> <p>8 that you didn't provide to counsel for</p> <p>9 Weyerhaeuser?</p> <p>10 A. Well, I would say two things,</p> <p>11 one, two documents that are listed in my</p> <p>12 list of references that I didn't provide</p> <p>13 because these are books, and I don't have a</p> <p>14 PDF or -- one particular, is a book of more</p> <p>15 than a thousand pages, is pretty thick.</p> <p>16 Q. What's the title of that book?</p> <p>17 A. This is the third edition of</p> <p>18 Cancer Epidemiology and Prevention, and I</p> <p>19 quoted in my report if I remember correctly</p> <p>20 the chapter I wrote in this book on</p> <p>21 mesothelioma, I don't remember how exactly</p> <p>22 the title is. So this is just one chapter</p> <p>23 in this thick book. And the second is</p> <p>24 another book that I edited myself with two</p> <p>25 other colleagues and this is a book called</p>
<p style="text-align: right;">Page 7</p> <p>1 Q. I've marked as Exhibit 1 and 2 a</p> <p>2 copy of the notice of deposition and at</p> <p>3 least one of the subpoenas. And I'm just</p> <p>4 asking you, doctor, are you appearing here</p> <p>5 today pursuant to our request to take your</p> <p>6 deposition on the notice?</p> <p>7 A. Yes, although the location is</p> <p>8 wrong, as you know.</p> <p>9 Q. Yes, right. We fixed the -- it's</p> <p>10 850 Third Avenue, not 350 Third Avenue.</p> <p>11 That was fixed eventually, because</p> <p>12 obviously we're all here.</p> <p>13 A. Yes.</p> <p>14 Q. And then did you see or get</p> <p>15 what's been marked as Exhibit 2, which is a</p> <p>16 subpoena that asks for certain documents,</p> <p>17 for lack of a better word, often in</p> <p>18 American litigation called an expert</p> <p>19 witness file?</p> <p>20 A. Yes, I've seen this.</p> <p>21 Q. Okay, and my understanding is</p> <p>22 that you provided those documents to</p> <p>23 counsel for Weyerhaeuser and counsel for</p> <p>24 Weyerhaeuser sent them to the plaintiffs.</p> <p>25 Did you provide your file to counsel for</p>	<p style="text-align: right;">Page 9</p> <p>1 Cancer Epidemiology, something like that,</p> <p>2 which I published a few years ago for</p> <p>3 Springer. And again, this is a review of</p> <p>4 the entire field of cancer epidemiology, so</p> <p>5 I couldn't really -- I can give you the</p> <p>6 information on how to get the books from,</p> <p>7 you know, internet or whatever, but I don't</p> <p>8 have it, a copy.</p> <p>9 Q. So you could give me the</p> <p>10 information of how to get the information</p> <p>11 from the Library of Congress, for example?</p> <p>12 A. Yes, exactly. So these are the</p> <p>13 two documents that are part of the list of</p> <p>14 references in my report that was not</p> <p>15 included because I didn't have it.</p> <p>16 Q. You didn't have it and it was</p> <p>17 voluminous and it would be hard to get.</p> <p>18 A. And the second is many, many</p> <p>19 other papers and studies on asbestos,</p> <p>20 mesothelioma, et cetera, that I've been</p> <p>21 reading or writing in part myself over the</p> <p>22 course of years that in a way I didn't use</p> <p>23 exactly, I didn't consult them for this</p> <p>24 case, but part of my general knowledge in</p> <p>25 this field, particularly when I say</p>

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<p style="text-align: right;">Page 10</p> <p>1 something or write something about asbestos 2 or mesothelioma I have all this knowledge 3 in the back of my mind. 4 Q. But you didn't consider them 5 specifically for this case, but they would 6 be things, both articles you wrote and 7 other articles in the published medical and 8 scientific literature that form your 9 general working knowledge about the 10 carcinogenicity of asbestos and the hazards 11 of asbestos, for example? 12 A. Yes. 13 Q. At a break some time, could you 14 provide me with the ISBN number or whatever 15 other identifying data that could help me 16 find those two books? 17 A. Yes, absolutely. 18 (Exhibit 3, Export Report of 19 Paolo Boffetta, marked for 20 identification.) 21 Q. Alright. Now, I've marked as 22 Exhibit 3 this document. Could you tell me 23 what this is? 24 A. Yes. This is the report that I 25 prepared to review in particular the</p>	<p style="text-align: right;">Page 12</p> <p>1 mean should be consistent to what I will 2 say in a court, unless new evidence comes 3 up, obviously. 4 Q. Is it your understanding that the 5 purpose of a federal expert witness report 6 is to have the expert write down his or her 7 opinions and the bases for those opinions 8 for the purposes of giving opinion 9 testimony in a case? Is that consistent 10 with your understanding? 11 A. Yes. That's what I tried to say 12 before. 13 Q. Are there any opinions that you 14 intend to express at trial that you haven't 15 included in your federal expert witness 16 report? 17 A. Not as today. As I said, if, 18 obviously, new evidence comes up between now 19 and the date when I would be asked to give 20 an opinion at trial, I may have to take 21 this new evidence into account, I suppose. 22 Q. Okay, but based on -- would you 23 agree with me that the vast majority of 24 your opinions in this relate to a 25 discussion of epidemiological studies and</p>
<p style="text-align: right;">Page 11</p> <p>1 relationship between residential and 2 household exposure to asbestos and 3 mesothelioma for the purpose of this case. 4 I did it per the request of Mr. McGuffey 5 and the other lawyers in that firm. 6 Q. In the Forman Watkins firm? 7 A. Yes, in the Forman Watkins firm. 8 Q. And my understanding is that you 9 were working in this case only for the 10 Weyerhaeuser Corporation, Weyerhaeuser 11 Company, and you're not an expert for 3M, 12 is that correct? 13 A. That's also my understanding. 14 Q. Okay. You understand this case 15 is pending in a federal court, do you 16 understand that? 17 A. Yes. 18 Q. Do you understand the purpose of 19 a federal expert witness report? 20 A. Well, I think this is something 21 that can be produced for the litigation, 22 and then I can be invited to give testimony 23 if this be requested, so I would have to 24 sort of, this report summarizes my opinions 25 on this case, that would be similar to -- I</p>	<p style="text-align: right;">Page 13</p> <p>1 applying those studies to either A, the 2 Marshfield situation or B, a review of 3 Dr. Henry Anderson's opinion? 4 A. Yes, absolutely. 5 Q. And so unless there is some new 6 information about either Marshfield or from 7 Dr. Anderson or some study in the medical 8 literature, would you agree with me that 9 this report should be fairly comprehensive 10 and complete as of today? 11 A. Yes, it is as of today, for sure. 12 (Exhibit 4, Curriculum Vitae of 13 Paolo Boffetta, marked for 14 identification.) 15 Q. Premarked as Exhibit 4 is a copy 16 of the CV that was provided to us and this 17 was a copy of the CV that was provide to us 18 and that we got somehow. Is Exhibit 4 a 19 copy of your CV? 20 A. Yes, number 4. 21 Q. And the date on it says 6 22 October, 2017. Do you have a more current 23 version of this? 24 A. Of my CV, yes, I do have a 25 more -- I think I updated maybe a couple of</p>

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<p style="text-align: right;">Page 14</p> <p>1 weeks ago, I don't remember exactly. I 2 update it every few months on a regular 3 basis. 4 Q. Could you provide that to counsel 5 for Weyerhaeuser and he can get it to me in 6 the ordinary course. 7 MR. McGUFFEY: We'll do that. 8 Q. Whatever your most current CV. 9 Do you follow the standard with -- you put 10 the most recent on the top as opposed to 11 the oldest on the top? 12 A. Yes, this is what I do. 13 Q. Alright, so it looks like the 14 most recent from this CV is a -- looking at 15 page 11 of Exhibit 4, it's a paper you 16 published relating to cigar and pipe 17 smoking and cancer risk in men. Look at 18 Exhibit 4, number 11. 19 A. Yes this is the most recent I 20 had at that time. 21 Q. And I take it from your answer 22 that there are other papers you published 23 since then? 24 A. Yes. I can look at an electronic 25 copy if you want now and I can tell you how</p>	<p style="text-align: right;">Page 16</p> <p>1 on genetics of mesothelioma. 2 Q. Let me ask you this. Is it your 3 opinion that the bap1 genetic mutation can 4 cause mesothelioma by itself in the absence 5 of asbestos exposure, or is it your opinion 6 that the bap1 genetic mutation plus 7 asbestos exposure causes an increased risk 8 of mesothelioma? 9 A. My understanding is that there 10 has been no interaction shown between 11 asbestos and bap1, so there are bap1 12 mutated cases both among those in the 13 tumors of people exposed to asbestos and in 14 the people we know have minimal asbestos 15 exposure. In our study everybody was 16 exposed because it was a cohort of asbestos 17 workers, so we looked at duration or 18 latency of exposure, those with the longer 19 duration or shorter duration, and there was 20 no difference in the proportion of mutation 21 in bap1 between the groups. So bap1 22 mutation is important in mesothelioma, bap1 23 is an important gene, but it doesn't seem 24 to reflect the carcinogenicity of asbestos. 25 They seem to be related both to asbestos</p>
<p style="text-align: right;">Page 15</p> <p>1 many more papers there are now in the 2 current version. This is the Minotra 3 paper, so I have 12 more papers and maybe a 4 few other documents and a few other invited 5 lectures and grants and these sort of 6 things. 7 Q. Okay, so if you could get counsel 8 for Weyerhaeuser your most current version 9 of the CV, maybe even email it to him and 10 he can email it to me. Just for my 11 purposes, do any of those 12 papers have 12 anything to do with asbestos? 13 A. I need to check, sorry. I don't 14 remember, as the different papers come out. 15 Yes, one is on asbestos exposure and risk 16 of asbestosis based on the cohort of 17 Italian asbestos textile workers that I 18 published already, other papers that are on 19 the list you have already. Another one is 20 on bap1, which is a gene involved in 21 mesothelioma, so we did an analysis of bap1 22 mutation in the case of mesothelioma in the 23 same asbestos textile, and that's it. So 24 there are two new papers related to 25 asbestos, one on asbestosis, the other one</p>	<p style="text-align: right;">Page 17</p> <p>1 and non-asbestos. 2 Q. So is it your opinion that 3 someone who was never exposed to asbestos 4 from any source, leaving aside the question 5 whether that's possible in the 6 industrialized world, assuming that there 7 is no asbestos exposure, environmental, 8 occupational, domestic, none at all that 9 can be identified, but they have the bap1 10 gene, do you believe that having the bap1 11 gene itself without having any asbestos 12 exposure can either cause mesothelioma or 13 increase the risk of mesothelioma? 14 MR. McGUFFEY: Object to form. 15 A. I'm not sure that causing is the 16 right word, because my understanding is 17 that -- by the way, everybody has the gene 18 obviously, the point is to have the 19 mutation in the gene. 20 Q. Yes. 21 A. My understanding is that the 22 mutation is part of the process of 23 developing mesothelioma. Whether it causes 24 mesothelioma or it is just one step that 25 reflects whatever is the real cause, I</p>

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<p>1 don't know. So I'm not sure that causing 2 is the right way to see the role of bap1 in 3 mesothelioma. Having said that, as I said 4 before, I think you can have mutative cases 5 both with asbestos exposure and without 6 asbestos exposure. This is my 7 understanding, or with minimal exposure 8 following your -- there are cases of 9 mesothelioma, as you know, following other 10 exposures, like thoroclast for example. 11 Q. Or erionite for example? 12 A. Well, erionite is a fiber which 13 is probably acting similar to amphiboles, 14 but I don't think we have enough evidence 15 to know whether these other causes -- I 16 mean these other groups of cases also have 17 the same proportion of bap1 mutation. But 18 to answer your question, my answer would be 19 yes, I think there are cases of 20 mesothelioma with a mutation bap1 which are 21 independent of exposure to asbestos with or 22 without, with high, with low exposure, 23 et cetera. 24 Q. Based on your understanding, did 25 either Ms. Kilty or Mr. Spatz have the bap1</p>	<p>1 about whether or not their mesothelioma was 2 related to asbestos exposure? 3 A. Yes, this is correct. 4 Q. Do you agree generally that 5 Ms. Kilty and Mr. Spatz both developed 6 pleural mesothelioma? 7 A. Yes, this is my understanding 8 from reviewing their medical records. 9 Q. And do you agree that both of 10 them, that the cause of their mesothelioma 11 was asbestos exposure? 12 A. Given that both had occupational 13 exposure to asbestos, I think that's a very 14 reasonable conclusion, I think. 15 Mesothelioma without any asbestos exposure 16 is extremely rare, so I think that as a 17 corollary, most of the cases or basically 18 all the cases in patients with high 19 exposure or some occupational exposure can 20 be attributed to their exposure. 21 Q. Okay. So you have agreed to send 22 counsel for Weyerhaeuser your most current 23 CV, and when we get to a break if you could 24 just do that, and maybe if I could get it 25 at another break, I'll see if I have any</p>
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<p>1 genetic mutation that is associated with 2 mesothelioma? 3 A. This is something I don't 4 remember. I don't know, I cannot answer 5 that. 6 Q. So if Dr. Maddox examined that 7 question for one of the patients and 8 concluded that they did not, you wouldn't 9 be in a position to refute that? 10 A. Yes, if I see some documents 11 about the genetic analysis I can comment. 12 But as I said before, to me this would not 13 change anything in terms of the possible 14 role of asbestos, because there are cases 15 with the mutation and without the mutation 16 both among those with heavy exposure, with 17 medium exposure, low exposure and so on. 18 Q. Okay, but I take it that you have 19 not investigated the question of whether 20 either Ms. Kilty or Mr. Spatz had the bap1 21 genetic mutation. You haven't looked at 22 that? 23 A. No, I have not. 24 Q. And whatever that investigation 25 may show, it wouldn't affect your opinions</p>	<p>1 followup. But you can put Exhibit 4 aside. 2 The one we're going to be coming back to is 3 Exhibit 3. But 1, 2 and 4 I think we're 4 done with. 5 (Exhibit 5, List of trial and 6 deposition testimony, marked for 7 identification.) 8 (Exhibit 6, Invoice dated January 9 8, 2018, marked for identification.) 10 I have placed what's been marked 11 as Exhibit 5 and Exhibit 6 in front of you, 12 doctor. Exhibit 5 is the testimony list 13 and 6 is the invoice. Let's start with 14 Exhibit 6, even though I marked 5 first. 15 Exhibit 6 is an invoice dated January 8th, 16 year 2018? 17 A. Yes, this is correct. 18 Q. And it shows that your consulting 19 fees for the period December, 2017 to 20 January, 2018, you spent a total of 21 43 hours at a rate of \$450 an hour in 22 preparation of the expert report in this 23 case, correct? 24 A. Yes, this is correct. 25 Q. Okay. When were you first</p>

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<p>1 contacted by lawyers working for</p> <p>2 Weyerhaeuser to talk about the possibility</p> <p>3 of testifying as an expert in Kilty or</p> <p>4 Spatz cases?</p> <p>5 A. If I remember correctly, it was</p> <p>6 maybe some time in November, probably late</p> <p>7 November, 2017. I don't remember the date.</p> <p>8 I should go back and check exactly if you</p> <p>9 want.</p> <p>10 Q. And what did they tell you about</p> <p>11 the case and what your role in it would be?</p> <p>12 A. Well, I don't remember the exact</p> <p>13 conversation, but they told me about these</p> <p>14 two plaintiffs who had occupational -- who</p> <p>15 were employed in this company and they were</p> <p>16 now -- they developed mesothelioma and they</p> <p>17 were claiming that the household, and for</p> <p>18 one of them the residential exposure were a</p> <p>19 major component in the causation of their</p> <p>20 disease. So they asked me whether I was</p> <p>21 ready to write a report where I was putting</p> <p>22 prospective effect of occupational exposure</p> <p>23 to asbestos versus residential and</p> <p>24 household exposure in causing mesothelioma.</p> <p>25 And then they explained me a bit about, you</p>	<p>1 during one hour with Mr. McGuffey today.</p> <p>2 Q. How many times have you met with</p> <p>3 any of the lawyers that work for</p> <p>4 Weyerhaeuser in this case?</p> <p>5 A. I think this is the second time</p> <p>6 if I'm correct. We met only once at the</p> <p>7 beginning and then we had a few telephone</p> <p>8 calls.</p> <p>9 Q. So you met once at the beginning</p> <p>10 of November or thereabouts. Was it with</p> <p>11 Mr. McGuffey?</p> <p>12 A. Yes, and a colleague of yours.</p> <p>13 MR. MCGUFFEY: Trey Watkins.</p> <p>14 Q. And that was here in New York?</p> <p>15 A. Yes, they came to my --</p> <p>16 Q. Your office at Mount Sinai?</p> <p>17 A. Yes, at Mount Sinai.</p> <p>18 Q. What documents did you review</p> <p>19 about the Marshfield plant or Mr. Spatz or</p> <p>20 Ms. Kilty?</p> <p>21 A. Well, I had many documents. I</p> <p>22 reviewed mainly the report of the</p> <p>23 industrial hygienist.</p> <p>24 Q. Frank Parker?</p> <p>25 A. Yes, I think so. I need to check</p>
Page 23	Page 25
<p>1 know, what this company was -- what the</p> <p>2 business, where exposure was present in the</p> <p>3 company and the period, et cetera. So it</p> <p>4 was a sort of general introduction on the</p> <p>5 two cases and asking my -- whether I was</p> <p>6 interested in preparing a report on this</p> <p>7 aspect, I would say role of environmental, I</p> <p>8 mean residential neighborhood, and</p> <p>9 household compared to occupational</p> <p>10 exposure.</p> <p>11 Q. Okay. Your invoice shows</p> <p>12 43 hours of work up through January 8th.</p> <p>13 Does this include all the work you did on</p> <p>14 the case up to that point in time?</p> <p>15 A. Yes. As you see, my report is</p> <p>16 dated January 5th, so I basically finish it</p> <p>17 during the end of the year holidays, I put</p> <p>18 it together and then a few days later I</p> <p>19 put in my invoice, and I haven't done</p> <p>20 anything after that until now.</p> <p>21 Q. Did you do anything to prepare</p> <p>22 for this deposition?</p> <p>23 A. Well, I reviewed again my report,</p> <p>24 I reviewed some of the key studies, I</p> <p>25 reviewed Dr. Anderson's report, and I met</p>	<p>1 the names. Sorry, can I check?</p> <p>2 Q. Sure. This is not a memory test.</p> <p>3 I'm trying to understand what you did and</p> <p>4 what your opinions are. I don't believe in</p> <p>5 memory tests of experts at depositions. It</p> <p>6 may be different if it was a fact witness.</p> <p>7 A. Yes, I think it was Parker and it</p> <p>8 was also Robert Adams.</p> <p>9 Q. Okay, so you reviewed the</p> <p>10 industrial hygiene report of the</p> <p>11 plaintiff's expert Mr. Parker and the</p> <p>12 defense expert Mr. Adams, correct?</p> <p>13 A. Yes.</p> <p>14 Q. Did you come to an understanding</p> <p>15 of what type of asbestos the Weyerhaeuser</p> <p>16 facility in Marshfield used for purposes of</p> <p>17 making these fire doors?</p> <p>18 A. My understanding is that it was a</p> <p>19 mixture of chrysotile and amosite.</p> <p>20 Q. Have you ever heard of Kaylo as</p> <p>21 an insulation product?</p> <p>22 A. No, I don't remember this now.</p> <p>23 Q. Okay, Kaylo was an insulation</p> <p>24 product originally designed by a company</p> <p>25 called Owens-Illinois that sold the</p>

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<p>1 business to Owens Corning that was a 2 mixture of amosite and chrysotile in the 3 Kaylo insulation. You never heard of that? 4 A. I don't remember that particular 5 name. 6 Q. But you understand that in 7 Marshfield from some time in the 50s up 8 until the late 70s, they used a 9 combination of chrysotile and amosite to 10 make the cores of the doors they were 11 selling? 12 MR. McGUFFEY: Objection to 13 form. 14 A. Well, yes, this is what I said 15 before. I understand there was chrysotile 16 and amosite. 17 Q. And do you understand that it was 18 used in this plant in Marshfield from some 19 time in the early to mid-1950's up until 20 1977 or 1978? 21 MR. McGUFFEY: Object to form. 22 A. Yes, my understanding is that for 23 some time at the beginning they were buying 24 the product and they were just, you know, 25 cutting and adapting to their product, and</p>	<p>1 Ms. Kilty or Mr. Spatz were exposed to 2 asbestos in the plant on some occasions 3 with fiber concentration levels higher than 4 10 fibers per cubic centimeter? 5 A. I think there were a few 6 measurements so high. If I remember most 7 of the measurements were around 1 or maybe 2, 8 but occasionally there very high measurements. 9 Q. You are a medical doctor by 10 training? 11 A. Yes, that is correct. 12 Q. You would agree with me that 13 breathing asbestos at a one fiber per cc 14 concentration is not something you would 15 recommend people to voluntarily expose them 16 to based on what we know today, correct? 17 A. Yes, I agree. 18 Q. Other than the attorneys 19 Mr. Watkins and Mr. McGuffey, did you talk 20 to any Weyerhaeuser employees, anybody who 21 worked there back in the 60's or 70's? 22 A. No, I did not. 23 Q. You didn't talk to Joseph 24 Wendlick, for example, who was an 25 industrial hygienist who did some testing</p>
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<p>1 then for about 10 years or so, from the 2 60s to '78 or so whenever it was finished 3 they were producing the material 4 themselves. 5 Q. They essentially reverse 6 engineered the Kaylo and made a mixture of 7 chrysotile and amosite to put in the doors 8 without buying the Kaylo from the 9 insulation company, is that your 10 understanding? 11 A. That's what I was trying to say. 12 Q. Did you see documents -- I 13 believe in your production of materials 14 there were air sampling results from inside 15 the plant at various times that could have 16 been relevant to Mr. Spatz or Ms. Kilty's 17 work there. Did you see documents like 18 that? 19 A. Yes, I remember there were some 20 measurements taken. I need to go back and 21 look at the sampling of the documents. 22 Well, the answer is yes, I think there were 23 measurements taken in the plant. 24 Q. And would you agree with me that 25 some of those measurements showed that</p>	<p>1 contemporaneously back in the 70's and 2 80's? 3 A. No, I did not. 4 Q. Did you do any air sampling in or 5 around Marshfield? 6 A. Myself, you mean? 7 Q. Yes. 8 A. No, I did not. 9 Q. Did you ask anybody to do that? 10 A. No, I did not. 11 Q. I believe you said you had two 12 in-person meetings with Weyerhaeuser's 13 attorneys, once yesterday with Mr. McGuffey 14 for about an hour and then back at the 15 beginning of the project with Mr. McGuffey 16 and Mr. Watkins? 17 A. Yes, two meetings, but the second 18 one was this morning, was not yesterday. 19 Q. Okay, this morning. And how many 20 phone calls approximately with the 21 attorneys for Weyerhaeuser, from the time 22 you first took on this assignment until 23 now? 24 A. Three or four I would say. I 25 don't remember frankly, but yes.</p>

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<p>1 Q. It's not that important, but I'm 2 always curious about that. If you said you 3 were on the phone with them five hours a 4 day every day between now and November, 5 that might lead to a different series of 6 questions. But it's not. 7 You went to medical school in 8 Italy, correct? 9 A. Yes, this is correct. 10 Q. Are you licensed to practice 11 medicine in the United States? 12 A. No, I'm not. 13 Q. Have you ever treated a patient 14 in the United States? 15 A. No, I have not. 16 Q. You are not a pathologist, 17 correct? 18 A. No, I'm not a certified 19 pathologist, no. 20 Q. Do you consider yourself to be an 21 expert in reviewing pathology to determine 22 the presence of cancer or any other 23 disease? 24 A. Well, I had training in pathology 25 as part of my general medical training.</p>	<p>1 in the field of occupational medicine as a 2 researcher, as an epidemiologist, but not 3 as a clinician, as a doctor treating 4 patients. 5 Q. So you're not an occupational 6 medicine doctor, and since you don't go and 7 take an exposure history from a patient and 8 try to figure out what, if any, 9 occupational exposures may have contributed 10 to their disease or condition. 11 A. Well, this is part of our 12 occupational epidemiology studies. So I do 13 it in -- well, maybe I don't do it myself, 14 I have people doing it for me as part of 15 research, not as part of treating or the 16 process of diagnosing and treating a 17 particular patient. 18 Q. Have you ever been hired by a 19 company that made or used asbestos to 20 design an occupational medicine and safety 21 program for its workers? 22 A. No, I have not. 23 Q. Let's take a quick look at your 24 testimony list. This is Exhibit 5. It 25 looks like in the past five years or</p>
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<p>1 But as I said, I'm not a pathologist. I've 2 not been reviewing slides for a long time 3 now. 4 Q. You're not an industrial 5 hygienist; am I correct? 6 A. Yes, you are correct, I am not. 7 Q. You are not a material scientist, 8 and by that I mean someone who has 9 expertise in testing substances to 10 determine whether they have asbestos fibers 11 or particles that look like asbestos in 12 them? 13 A. No, I'm not. 14 Q. Do you consider yourself to be an 15 occupational medicine doctor? 16 A. Well, I did not have a 17 specialization or a residency in 18 occupational medicine, although I did this 19 part of my rotation during my medical 20 training. I've not been treating people 21 for occupational disease obviously for a 22 long time. However, I am a member of the 23 Society for Occupational Medicine in Italy 24 of the International Committee of 25 Occupational Medicine, so I've been working</p>	<p>1 four years, you've testified once at trial 2 and three times by deposition in the United 3 States, is that correct? 4 A. Yes, this is correct. 5 Q. Prior to the four-year period 6 encompassed on this list, have you ever 7 testified in a trial in the United States 8 involving any subject as an expert? 9 A. You mean before this trial in 10 California? I think I did it once before, 11 and then I was involved also in a, how do 12 you call it, an arbitration. So I did this 13 too I think, as far as I remember. 14 Q. I'm just talking about the United 15 States. We'll get to your testimony and 16 work in Italy later. But just for purposes 17 of the United States, you think you've 18 testified twice in trial in courtrooms in 19 the United States and once in an 20 arbitration? 21 A. I think it was three times, 22 because I testified two times related to 23 the same issue before this one. 24 Q. Okay, what was -- 25 A. I don't remember, I don't think</p>

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<p>1 it was anything else.</p> <p>2 Q. What are the two times relating</p> <p>3 to the same issue? What was that case</p> <p>4 about?</p> <p>5 A. It was a case about a drug use</p> <p>6 for diabetes treatment, and which was</p> <p>7 supposedly linked to kidney cancer.</p> <p>8 Q. What was the name of the drug?</p> <p>9 A. Pioglitazone; and there were two</p> <p>10 trials, one was Louisiana if I remember and</p> <p>11 the other one in Philadelphia. They were</p> <p>12 close in time. No, the one in Las Vegas I</p> <p>13 think it was. These were trials related to</p> <p>14 the same, so I was working for the same law</p> <p>15 firm and for the same company.</p> <p>16 Q. The same company, and you were</p> <p>17 working at request of the pharmaceutical</p> <p>18 manufacturer?</p> <p>19 A. Of the defense, yes.</p> <p>20 Q. Have you ever testified or done</p> <p>21 work at the request of a plaintiff in a</p> <p>22 toxic tort or pharmaceutical case in the</p> <p>23 United States?</p> <p>24 A. Well, the case of Coplin vs Doe</p> <p>25 Run, I did it for the plaintiff. It was a</p>	<p>1 A. My deposition.</p> <p>2 Q. Your deposition. And do you</p> <p>3 remember the name of the lawyers that hired</p> <p>4 you for the case?</p> <p>5 A. No, but I can find it obviously.</p> <p>6 Q. Yeah, I'd like to figure that</p> <p>7 out.</p> <p>8 A. Okay.</p> <p>9 Q. And that was arsenic exposure in</p> <p>10 the lead smelting process leading to lung</p> <p>11 cancer, correct?</p> <p>12 A. Yes.</p> <p>13 Q. You said in your answer that</p> <p>14 based on your review of materials in that</p> <p>15 case, you concluded that the arsenic</p> <p>16 exposure more than doubled the victim</p> <p>17 plaintiff's risk of developing lung cancer.</p> <p>18 Do you recall testimony to that effect?</p> <p>19 A. It was not exactly this way. It</p> <p>20 was not correct when I replied earlier. In</p> <p>21 fact, I was mainly looking at -- I mean,</p> <p>22 obviously arsenic was a main agent</p> <p>23 involved, but I was really looking at the</p> <p>24 risk of lung cancer in lead smelters</p> <p>25 because there may be interaction with other</p>
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<p>1 deposition that didn't -- I think they</p> <p>2 didn't go to trial. They didn't ask me to</p> <p>3 go to trial.</p> <p>4 Q. Okay, what was the nature of that</p> <p>5 case? What was the Doe Run Energy?</p> <p>6 A. This was a worker who was working</p> <p>7 as a lead smelter in the 60s and 70s with</p> <p>8 exposure to arsenic and he developed lung</p> <p>9 cancer. And this was a case for</p> <p>10 compensation, I think.</p> <p>11 Q. Workers compensation?</p> <p>12 A. Workers compensation, so he was</p> <p>13 claiming that he had lung cancer because of</p> <p>14 his exposure.</p> <p>15 Q. Exposure to the arsenic in the --</p> <p>16 A. In the lead smelting.</p> <p>17 Q. In the lead smelting plant where</p> <p>18 he worked presumably.</p> <p>19 A. It was in his work, yeah, his</p> <p>20 work. And he had quite high exposure to</p> <p>21 arsenic, so I basically -- I mean my</p> <p>22 opinion was that, you know, this exposure</p> <p>23 was sufficient to give him more than</p> <p>24 twofold risk of developing lung cancer.</p> <p>25 Q. That was your testimony?</p>	<p>1 agents in the smelting process that may</p> <p>2 increase the risk. So in my report, in my</p> <p>3 deposition I didn't focus only on arsenic,</p> <p>4 but also on the general risk of materials</p> <p>5 metals, in particular lead smelters. So I</p> <p>6 think the story of the relative risk higher</p> <p>7 than two over ten was more related to</p> <p>8 the job than to the specific agent.</p> <p>9 Q. In order for you to determine</p> <p>10 that exposure or use of chemical or toxin X</p> <p>11 can cause disease Y, do you have to be</p> <p>12 shown evidence that it doubles the risk of</p> <p>13 the disease in a statistically significant</p> <p>14 way, or can you ascribe causation even</p> <p>15 if the risk, the absolute risk, is not</p> <p>16 doubled but there is an elevated</p> <p>17 statistically significant risk of disease?</p> <p>18 MR. McGUFFEY: Object to the</p> <p>19 form.</p> <p>20 A. No, I clearly -- the requirement</p> <p>21 of doubling the risk, I mean this issue of</p> <p>22 doubling the risk is not a requirement for</p> <p>23 causation. I mentioned it for this</p> <p>24 particular case because this was a question</p> <p>25 that was asked specifically. I think they</p>

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<p>1 wanted to show that it was more likely than 2 not or whatever. But this was nothing to 3 do with the process of determining position 4 in medicine or in epidemiology, that 5 obviously can be a risk much higher than 6 two, and not sufficiently consistent or 7 supported by different lines of evidence to 8 conclude for causation, and conversely they 9 can be the risk below two which are very 10 strongly supported by many studies, et 11 cetera, that would allow concluding for 12 causation, so the two things are 13 independent. 14 Q. The Isenhour versus Norfolk 15 Southern case, what was that case about and 16 what was your role in it? 17 A. This is a person who developed 18 idiopathic pulmonary fibrosis, IPF, and 19 he -- I mean the claim was that this was 20 due to exposure to diesel exhaust or 21 asbestos in the railway industry. 22 Q. And you were working for Norfolk 23 Southern? 24 A. Yes, for the defense, yes. 25 Q. And I take it your testimony was</p>	<p>1 exposure, correct? 2 A. Yes. 3 Q. You do recognize that asbestos 4 causes asbestosis, obviously? 5 A. Yes. As I told you, I have a 6 recent paper on that. 7 Q. And am I correct that in the 8 Isenhour versus Norfolk Southern case, was 9 there any dispute about whether 10 Mr. Isenhour had IPF versus asbestosis from 11 the point of view either pathologically or 12 people looking at X-rays or CT scans to try 13 to make a differential diagnosis? 14 MR. McGUFFEY: Object to form. 15 A. Yes, there was, but I remember 16 that there were no fibers found in the same 17 person. There was no -- the radiologic 18 pattern was compatible with IPF and not 19 with asbestosis. Anyway, this is not the 20 pattern that I reviewed because obviously 21 I'm not a pathologist. 22 Q. Right, so there was -- I'm just 23 trying to understand a little bit. There 24 was a dispute, on the one hand you had 25 presumably a medical doctor, a</p>
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<p>1 that Mr. Isenhour wasn't exposed to enough 2 either diesel fuel or asbestos to cause 3 pulmonary fibrosis? 4 A. Not exactly was that there is no 5 evidence of that, these two agents caused 6 idiopathic pulmonary fibrosis, IPF. This 7 was really my main -- the main topic was -- 8 I discussed also the specific exposure, but 9 given that I concluded that there was no 10 evidence that asbestos or diesel may cause 11 IPF, IPF by definition means that there are 12 no known causes, idiopathic, that's the 13 meaning of the word. And I reviewed all 14 the studies on IPF and these different 15 agents, including employment in the railway 16 industry and diesel exhaust, and basically I 17 concluded that there was no -- the link was 18 not demonstrated that this exposure, this 19 agent may cause IPF. 20 Q. Let's break that down a little 21 bit. IPF is an acronym that stands for 22 idiopathic pulmonary fibrosis, correct? 23 A. Yes. 24 Q. Asbestosis by definition is 25 pulmonary fibrosis caused by asbestos</p>	<p>1 pulmonologist or pathologist for 2 Mr. Isenhour saying he had asbestosis and 3 Norfolk Southern had somebody that was 4 similarly qualified saying he had IPF, and 5 your role in the case as I understand it 6 was to say, looking at the epidemiological 7 literature and the disease IPF, is there 8 any evidence, or is there sufficient 9 evidence to show that either asbestos 10 exposure or diesel exhaust fume can cause 11 the medical condition called IPF? Is that 12 what your role was in the case? 13 A. This was my role indeed. 14 Q. Alright. And then the other two 15 cases on the list involve Starbucks 16 Corporation, right? 17 A. Well, coffee producers, many of 18 them. 19 Q. Many of them, one of which is 20 Starbucks, I take it? 21 A. The first in the list. 22 Q. Alright, and you were working for 23 the coffee producers in this California 24 case? 25 A. Yes, indeed.</p>

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<p>1 Q. And the issue as I take it is</p> <p>2 whether or not drinking coffee creates an</p> <p>3 excess risk of a certain type of cancer?</p> <p>4 A. It was a little bit more</p> <p>5 complicated than that. This was a case</p> <p>6 related to what's called Proposition 65, so</p> <p>7 the issue of labeling consumer products as</p> <p>8 known to the state of California to cause</p> <p>9 cancer or birth defects, and the claim was</p> <p>10 that because coffee contains acrylamide and</p> <p>11 acrylamide can cause cancer in animals</p> <p>12 under experimental conditions, coffee</p> <p>13 should be labeled as a human carcinogen.</p> <p>14 And my role was to review the epidemiology</p> <p>15 of acrylamide and cancer in humans. There</p> <p>16 are several studies in industrial workers</p> <p>17 and also a general population with</p> <p>18 biomarkers of acrylamide in blood, and also</p> <p>19 the very vast literature on coffee drinking</p> <p>20 and cancer. And the studies on coffee and</p> <p>21 cancer are many. They were conducted and</p> <p>22 there is overwhelming evidence that if</p> <p>23 anything, certain cancers are prevented by</p> <p>24 coffee or there is a reduced risk, whether</p> <p>25 it's prevention or something else, I'm not</p>	<p>1 Q. So that concludes the list of</p> <p>2 testimony on this list. Am I correct that</p> <p>3 the Coplin case is the only case you have</p> <p>4 testified for a plaintiff in any kind of</p> <p>5 toxic tort litigation?</p> <p>6 A. The one I did a deposition, yes.</p> <p>7 Q. Okay, that's the Coplin versus</p> <p>8 Doe Run Injury No blah-blah-blah?</p> <p>9 A. Yes.</p> <p>10 (Recess taken: 10:02-10:16 a.m.)</p> <p>11 FURTHER EXAMINATION BY MR. FINCH:</p> <p>12 (Exhibit 7, Summary of Kilty</p> <p>13 case, marked for identification.)</p> <p>14 (Exhibit 8, Summary of Spatz</p> <p>15 case, marked for identification.)</p> <p>16 Q. Dr. Boffetta, I'm going to place</p> <p>17 what I have marked Exhibit 7 and 8 in front</p> <p>18 of you. What is Exhibit 7?</p> <p>19 A. It looks like a summary of the</p> <p>20 Kilty case.</p> <p>21 Q. And what is Exhibit 8?</p> <p>22 A. A summary of the case of</p> <p>23 Mr. Spatz.</p> <p>24 Q. I will represent to you that I</p> <p>25 found these materials in the file that</p>
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<p>1 sure, but clearly there is no increased</p> <p>2 risk. For acrylamide there is very weak</p> <p>3 evidence for one particular cancer, which</p> <p>4 was kidney cancer, based on very few cases</p> <p>5 and in small studies. So that is what I</p> <p>6 reviewed basically, acrylamide and cancer</p> <p>7 and coffee drinking and cancer.</p> <p>8 Q. Okay, and that had to do with the</p> <p>9 issue of whether the State of California is</p> <p>10 going to require coffee to be labeled as a</p> <p>11 potential carcinogen or something like</p> <p>12 that?</p> <p>13 A. Yes.</p> <p>14 Q. And I take it that your opinion</p> <p>15 based on the overwhelming amount of</p> <p>16 epidemiological and scientific literature</p> <p>17 related to coffee specifically is that</p> <p>18 drinking coffee doesn't increase your risk</p> <p>19 of cancer in any significant way?</p> <p>20 A. Yes, this is my opinion.</p> <p>21 Q. That's good, since I had three</p> <p>22 cups of coffee this morning.</p> <p>23 A. There are, as I said, a few</p> <p>24 cancers that if anything are reduced for</p> <p>25 people drinking coffee.</p>	<p>1 counsel for Weyerhaeuser produced that was</p> <p>2 part of your file. Have you ever seen</p> <p>3 these documents before?</p> <p>4 A. Yes.</p> <p>5 Q. Did you play any role in</p> <p>6 preparing them?</p> <p>7 A. No. This was a summary that was</p> <p>8 sent to me by counsel.</p> <p>9 Q. Okay, so it's your understanding</p> <p>10 these are documents that summarize certain</p> <p>11 information about Ms. Kilty or Mr. Spatz</p> <p>12 that were prepared by the lawyers for</p> <p>13 Weyerhaeuser or people that worked for the</p> <p>14 lawyers for Weyerhaeuser?</p> <p>15 A. I suppose so. I received from</p> <p>16 them. I don't know who prepared them.</p> <p>17 Q. Okay, you didn't prepare them?</p> <p>18 A. No, that's what I told you.</p> <p>19 Q. And they prepared this</p> <p>20 information, and did they tell you you</p> <p>21 could assume or rely on it as if it were</p> <p>22 true?</p> <p>23 A. Yes. Well, I checked some of the</p> <p>24 information against the other records that</p> <p>25 I had, but yes, that's basically -- if you</p>

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<p style="text-align: right;">Page 46</p> <p>1 ask what they said, I suppose -- well, they  2 didn't say that they were true, but I  3 assume they were. That's the reason they  4 sent them to me.  5 Q. Do you know how many -- first of  6 all, Ms. Kilty died of mesothelioma in the  7 year 2015 at the age of 83, correct?  8 A. Yes, that's my understanding.  9 Q. Okay, and for some period of time  10 she lived a little less than -- between a  11 half mile and a mile from the Marshfield  12 facility, correct?  13 A. Yes, she lived close to the  14 factory, close to the plant.  15 Q. And she worked in the factory, in  16 the part of the factory where they used  17 asbestos to make core doors for some period  18 of time, correct?  19 A. Yes, this is my understanding.  20 Q. Do you have any understanding as  21 to whether or not she wore a 3M mask during  22 the time she was working in the factory in  23 the asbestos core door?  24 A. No, I don't remember this  25 particular aspect of her exposure.</p>	<p style="text-align: right;">Page 48</p> <p>1 testimony that at best the 3M masks keep  2 out somewhere between 10 to 30 percent of  3 asbestos from the user of the mask -- let  4 me ask that question a different way.  5 I want you to assume that there  6 will be testimony from an industrial  7 hygienist that at best the 3M masks allow  8 somewhere between 10 to 30 percent of the  9 asbestos fibers that the wearer is exposed  10 to to get through the mask and breathe in.  11 You wouldn't be in any position to refute  12 that testimony, would you, sir?  13 A. Yes, this is correct, I would not  14 be.  15 Q. Okay. I want you to assume that  16 the masks are only 90 percent effective,  17 meaning that 10 percent of the asbestos  18 fibers in the environment that Ms. Kilty  19 was, was in the plant, were still able to  20 get through the masks and into her  21 breathing zone. First of all, what is 10  22 percent of 3.7 fibers per cc?  23 A. It would be 0.37 fibers per cc.  24 Q. Right. And so if she was in that  25 kind of environment for a sustained period</p>
<p style="text-align: right;">Page 47</p> <p>1 Q. In the description of the  2 personal monitoring for her at Exhibit 7,  3 there is results of testing measured 3.7  4 fibers per cubic centimeter and 1975  5 testing measured 4.2 fibers per cubic  6 centimeter, do you see that?  7 A. Yes.  8 Q. Okay. And that would have been  9 to a mixture of amosite and chrysotile  10 which was being used to make the doors?  11 A. Yes, I assume this is correct.  12 Q. Okay. I take it that you were  13 not -- or let me ask you this. Are you an  14 expert in the efficacy of 3M masks to  15 prevent or shield out asbestos exposure?  16 A. No, I am not.  17 Q. You don't hold yourself out as  18 either a mask expert or an industrial  19 hygienist who has studied the question of  20 how effective, if at all, a 3M 8710 mask  21 would be to keep asbestos fibers from being  22 breathed in if the wearer was using them?  23 A. No, I'm not. I don't pretend  24 this.  25 Q. Okay. If there is expert</p>	<p style="text-align: right;">Page 49</p> <p>1 of time being exposed to chrysotile and  2 amosite and .37 fibers per cc were getting  3 through, you would agree with me that is a  4 type of occupational exposure that you  5 would want people to avoid, correct?  6 MS. BUDNER: Object to form.  7 A. Certainly, yes.  8 Q. I mean, in fact there is  9 analytical epidemiology that shows that  10 occupational asbestos exposure at levels in  11 the range of .1 to .3 fibers cc years can  12 cause statistically significant excess risk  13 of mesothelioma, correct?  14 MR. McGUFFEY: Object to form.  15 A. No, I think if I take your  16 question literally, I think you are mixing  17 up two things, because we are talking here  18 about exposure level and you said .3 fiber  19 cc years, which is a measure of cumulative  20 exposure.  21 Q. Yes, I did that intentionally  22 because I wanted to -- let me break it up.  23 A. Because we were talking about  24 exposure levels.  25 Q. Let me break it up into steps.</p>

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<p>1 An exposure level of .3 fibers per cubic 2 centimeter is, in an occupational setting, 3 you as a medical doctor would tell people 4 to not expose themselves to asbestos at 5 that level, correct? 6 A. Yes, certainly. 7 Q. And you would believe that that 8 level of exposure, even if it's for just 9 one day in an occupational setting, 10 presents some kind of risk to them? 11 A. Well, if it is one day, I don't 12 know what the risk would be. I don't think 13 there is any data on risk following one day 14 exposure frankly, so I don't know. And 15 people are not exposed typically for one 16 day. If they are exposed occupationally, 17 they are employed on a job. Well, maybe 18 there can be some people who are just 19 coming to the factory for training or an 20 interview and then not being hired and 21 leaving, but I don't know any data on the 22 risk of these people, so I cannot really 23 answer about this one day thing. 24 Q. Okay, let's leave it aside for 25 one day. If you were exposed at a level of</p>	<p>1 mesothelioma following asbestos exposure. 2 Duration of exposure, which is the one day 3 one year aspect that you mentioned does not 4 seem the major determinant of risk, times 5 his first exposure and level, so .3 or 6 whatever seem to be the major determinant. 7 So I know that there have been studies that 8 report the results by cumulative exposure. 9 As I said, I don't remember exactly what 10 the risk was at .3 fiber milliliter year 11 level was, maybe there are some studies 12 showing effect. But as I said, I don't 13 think this would be the best way to measure 14 the occupational -- the effect of 15 occupational exposure to asbestos. Sorry, 16 that was a long answer. 17 Q. No, I understand. You are of the 18 view that the most dominant variable in the 19 risk of mesothelioma, assuming there is 20 some occupational exposure to asbestos, is 21 not the intensity of the exposure or the 22 duration of the exposure, it's the time 23 since the first exposure? 24 A. Yes, that's my opinion, although 25 as I said, intensity of exposure also plays</p>
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<p>1 .3 fibers per cubic centimeter for one 2 occupational year, that is a fiber cc year, 3 correct? 4 A. Yes, it would be a measure of 5 cumulative exposure, .3 fiber cc years. 6 Q. .3 fiber cc years is a measure of 7 cumulative exposure to asbestos that one 8 can calculate based on multiplying what the 9 average intensity is times the time, 10 correct? 11 A. The duration. 12 Q. And you would agree with me that 13 there has been analytical epidemiology 14 showing a statistically significant excess 15 risk of mesothelioma from exposure levels 16 as low as 0.3 fiber cc years? 17 MR. McGUFFEY: Object to form. 18 A. I need to articulate my answer 19 here, I'm sorry. As of here now, I don't 20 remember studies that showed an increase 21 risk at the level of .3 cubic centimeter 22 years, although it may well be the case. 23 But the more general answer I would like to 24 say that cumulative exposure is not the 25 best way to quantify the risk of</p>	<p>1 an important role. I'm not saying that it 2 does not. The effect of duration seems to 3 be mainly related to the latency. And when 4 people adjust for latency there is not much 5 left for duration. That's my point. And 6 obviously the two are correlated. 7 Q. Okay, we'll unpack some of that. 8 Am I correct that Peto's studies back in 9 the early 80s showed that the time 10 variable, meaning time since first 11 exposure, was a cubic power increase in the 12 risk as compared to duration time and 13 intensity, is that your understanding? 14 A. No, it's not exactly this way. 15 It was a cubic or even more power of four 16 or something between three and four for 17 latency for time since first exposure, and 18 then there was an effect of intensity. There 19 was no factor, no term for duration in the 20 formula that Peto proposed, although there 21 are in some other formulas that have been 22 proposed. 23 Q. Well, regardless, you would, as 24 an occupational medicine doctor, you would 25 say an exposure to asbestos of .3 fibers</p>

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<p>1 per cc in occupational settings would be a 2 dangerous exposure for Ms. Kilty and she 3 shouldn't try to repeat it on a regular 4 basis, correct? 5 A. Yes, I'm not an occupational 6 doctor, as we said before, but yes, 7 absolutely, as a general doctor I would say 8 that. 9 Q. Do you know how many children 10 Ms. Kilty had who also worked in the 11 Marshfield facility at some period of time? 12 A. Yes. If I remember there were 13 four of them, four who worked, I don't 14 remember whether she had more, frankly. 15 Q. And do you know whether or not 16 Ms. Kilty washed her children's clothes 17 when they lived at home, when they were 18 also working at the mill? 19 A. Well, I assume she did. I think 20 she was involved in the washing of the 21 clothes. 22 Q. Do you know how long the Kilty's 23 lived within one half mile of the 24 Marshfield plant? 25 A. I don't remember this offhand,</p>	<p>1 Peto paper from 2009, I think you've cited 2 it. 3 A. Rake? 4 Q. Rake Peto, 2009, a British paper. 5 One of the areas they looked at was 6 non-occupational sources of exposure to 7 asbestos. 8 A. Yes, that's correct. 9 Q. And they found, am I correct, 10 that the one risk they identified is if you 11 lived with an asbestos exposed worker, 12 someone who worked in an asbestos facility 13 for some period of time prior to age 30, 14 that would create an excess risk of 15 mesothelioma for you? 16 A. Well, I would need to go back to 17 the paper. I don't remember the details 18 now. If I remember correctly, this was 19 restricted to people who did not have 20 occupational exposure, people who never 21 worked in an asbestos-related job and had a 22 husband who had -- or someone in the family 23 who had occupationally -- I should go back 24 to the paper. 25 Q. Okay, we'll get the paper out a</p>
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<p>1 frankly. 2 Q. If it was a period of several 3 years? 4 A. Several years anyway, yes. 5 Q. And leaving aside whether there 6 is any -- in your view any excess risk of 7 mesothelioma associated with the asbestos 8 that was brought into the Kilty home by the 9 clothes of the workers, i.e. the sons that 10 worked there, would you agree with me that 11 from the perspective of an epidemiology 12 study, you would treat the kind of exposure 13 Ms. Kilty experienced in her house from 14 people bringing asbestos dust home from the 15 factory as a domestic or household exposure 16 to asbestos? 17 MR. McGUFFEY: Objection to 18 form, foundation. 19 A. Well, if this is a general 20 question, yes. I mean, what is defined as 21 household exposure is what people are 22 exposed at home based on asbestos that is 23 typically brought from people who have been 24 occupationally employed. 25 Q. You are familiar with the Rake</p>	<p>1 little bit later. Turning from Kilty, 2 which is Exhibit 7, to Spatz, do you know 3 if Mr. Spatz's father worked at the 4 Marshfield facility at a time when asbestos 5 was being used? 6 A. Well, I remember that he worked 7 at the plant. Whether it was also during 8 the period when they were using asbestos, 9 maybe there was some overlap between the 10 two if I remember. It was I think at the 11 beginning of that period, in the 50s. 12 Q. So the early mid-50s? 13 A. Yes, mid-50s. 14 Q. And so for purposes of your 15 epidemiological opinions, are you taking it 16 as the basis for your opinion that 17 Mr. Spatz's father was exposed to asbestos 18 in the mill and brought some of that 19 asbestos home with him on his work clothes 20 from the mill? 21 MR. McGUFFEY: Object to form. 22 A. Well, I don't think we have any 23 direct evidence on that. I mean, we know 24 that he worked -- that he was not working 25 on the asbestos -- I mean at the time they</p>

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<p style="text-align: right;">Page 58</p> <p>1 were not producing, I mean manufacturing or  2 preparing this asbestos. Probably they  3 were I think using -- just cutting the  4 material that was coming from outside. And  5 I don't think his father was involved in  6 that operation. So probably he had very  7 minimal exposure in the plant, like you  8 know, probably everybody in the plant. I  9 don't know, I don't have any data on what  10 could have been the exposure of his father.  11 Q. You don't have any fiber  12 measurements of his father like the way you  13 do for the son, correct?  14 A. Yes, exactly, or for the other  15 plaintiff.  16 Q. Right. But if he was working in  17 the plant at the time they were cutting  18 Kaylo up to put it into doors, you would  19 have expected at least some of the time him  20 to have asbestos dust on his clothes,  21 correct?  22 MR. McGUFFEY: Object to the  23 form.  24 A. Well, if he was close enough to  25 the operation, yes, maybe, but I have -- I</p>	<p style="text-align: right;">Page 60</p> <p>1 general sense, yes.  2 Q. So you would agree that to the  3 extent that Mr. Spatz brought asbestos home  4 on his clothes into that railroad car where  5 he lived with his son, the asbestos would  6 stay inside that railroad car unless they  7 did something to decontaminate it, correct?  8 MR. McGUFFEY: Object to form.  9 A. Yes, if you brought any asbestos,  10 yes, but as I said, I don't see how he  11 could bring asbestos from the factory, I  12 mean beyond just, you know -- well, that I  13 think is my answer.  14 Q. Do you know if -- I asked you  15 this series of questions about Ms. Kilty.  16 Do you know if Mr. Spatz wore the 3M mask  17 for any period of time when he was working  18 in the mineral core department at the  19 Marshfield plant?  20 A. No, I don't know.  21 Q. And same series of questions.  22 According to the data that you were  23 provided in Exhibit 8 by the lawyers for  24 Weyerhaeuser, Mr. Spatz specifically was  25 exposed to asbestos on one occasion at a</p>
<p style="text-align: right;">Page 59</p> <p>1 don't think we had -- is not that everybody  2 who has been working in any location in a  3 plant where asbestos was used in one  4 particular operation had their clothes  5 covered with asbestos, there is no evidence  6 of this happening beyond, you know, just  7 general environmental exposure that  8 everybody has. Maybe in the plant there  9 was a little bit higher exposure. I have  10 seen no data for that, so I really don't  11 know how much asbestos was brought back on  12 his father's clothes back at that time.  13 Q. Okay. Do you understand where  14 Mr. Spatz and his father lived when his  15 father was working at the plant?  16 A. I don't think they were living  17 near the factory, if I remember.  18 Q. Do you understand that they were  19 living in a railroad car? I mean, their  20 whole house is about the size of this room.  21 A. I don't remember this thing.  22 Q. Do you agree with me that once  23 asbestos gets into someone's house, it's  24 very difficult to get it out?  25 A. Well, this is probably true in a</p>	<p style="text-align: right;">Page 61</p> <p>1 level of 14.83 fibers per cc, do you see  2 that?  3 A. Yes, this was one particular  4 measurement.  5 Q. And then other people that did  6 his job at various points in time, the  7 results ranged from .3 fibers per cc to 20  8 fibers per cc, right?  9 A. In the 70s, yes.  10 Q. And you would agree with me that  11 if the 3M mask was only 90 percent  12 effective in screening out asbestos from  13 the user, that would mean that Mr. Spatz  14 himself would have been exposed to asbestos  15 at a level of 10 percent of 14.83 fibers  16 per cc or 10 percent of the range shown in  17 the next bullet point, correct?  18 MS. BUDNER: Objection to form.  19 A. Yes, this is correct. This is a  20 case of 90 percent -- I mean 10 percent  21 exposure, yes.  22 Q. And 10 percent of those exposure  23 levels you would regard as dangerous for  24 workers to voluntarily expose themselves  25 to?</p>

16 (Pages 58 to 61)

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<p>1 A. Well, certainly because we would 2 be still well above one fiber cc, which is 3 a lot.</p> <p>4 Q. You did an analysis of the 5 mesothelioma rate in Wood County, which is 6 the county around the Marshfield plant, 7 correct?</p> <p>8 A. Well, an analysis may be too 9 much. I just looked at the data from the 10 cancer registry of the state by county.</p> <p>11 Q. Alright, let's not call it an 12 analysis. Let's call it a -- you put a 13 chart that depicted the mesothelioma rate 14 in various counties in Wisconsin as 15 compared to the state as a whole, correct? 16 It's in Exhibit 3 and hopefully your copy 17 is in color, because that's the best way to 18 see it. Is your copy in color?</p> <p>19 A. Yes, at figure 1.</p> <p>20 Q. Right. And this is -- why don't 21 you in your own words tell us what we're 22 looking at here in figure 1 on page 43 of 23 your report.</p> <p>24 A. Okay, in figure 1 I reproduced 25 two maps of the state of Wisconsin that I</p>	<p>1 mesothelioma for men in Wood County is 1.89 2 to 2.73 cases per 100 thousand, correct?</p> <p>3 A. Yes, this is what the map says.</p> <p>4 Q. And the overall state rate is 5 1.95 per 100 thousand, correct?</p> <p>6 A. Yes, this is correct.</p> <p>7 Q. The rate for Orange County (sic) 8 extends up to 2.73, correct?</p> <p>9 A. Not the rate for Wood county, the 10 rate for the category in which Wood County 11 is put. I didn't get the rate.</p> <p>12 Q. The rate for the category in 13 which Wood County is put is a range between 14 1.89 to 2.73, correct?</p> <p>15 A. Yes.</p> <p>16 Q. And would you agree with me that 17 is slightly higher than the overall 18 incidence rate for men in Wisconsin as a 19 whole?</p> <p>20 A. I'm not sure I would put it this 21 way. In fact the rate for the state as a 22 whole falls within this category. In other 23 words if we just use one color for the 24 entire state, it would be that color, so 25 the whole state would be orange.</p>
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<p>1 derived from the website of the Department 2 of Health of the state with a rate of 3 mesothelioma by county in men and women 4 during 2010 and 2014. This is color coded, 5 so there are four categories; light yellow 6 is the lowest and the red is the highest, 7 the county with the highest rates. And I 8 also put in the legend of the figure the 9 cut-points, which are different between men 10 and women, because as in most populations, 11 men have higher risk of mesothelioma than 12 women, so the cut-points are different. 13 And the purpose of this figure was to show 14 that the rate in Wood County, which I 15 indicated with the two maps were not 16 particularly high compared to the other 17 county or the state as a whole. I also 18 reported the rates for the state as a whole 19 in the legend.</p> <p>20 Q. Okay, let's unpack that a little 21 bit. The mesothelioma rate for Wood County 22 for men, you point an arrow, it looks like 23 it's orange, is that correct?</p> <p>24 A. Yes, this is my understanding.</p> <p>25 Q. Okay, so the rate for</p>	<p>1 Q. Now, you agree with me this rate 2 for Wisconsin as a whole, 1.95 per 100 3 thousand, includes people who are 4 occupationally exposed to asbestos, 5 correct?</p> <p>6 A. Oh, yes, certainly. These are 7 all the cases of mesothelioma in the state.</p> <p>8 Q. Okay, what is the rate for 9 mesothelioma in the state of Wisconsin for 10 people who have no occupational exposure to 11 asbestos, or no exposure to asbestos at all 12 from any source?</p> <p>13 A. I don't know. I don't think 14 anybody has ever studied this, so I have no 15 idea what would be the rate in people 16 without occupational exposure in Wisconsin.</p> <p>17 Q. Haven't you written in the past 18 that the incidence rate for mesothelioma is 19 on the order of one to two cases per 20 million person years?</p> <p>21 A. Oh, yeah, in general, but you 22 asked for specific for Wisconsin in this 23 period. This is what has been estimated, 24 yes. The overall -- I mean, the rate -- 25 it's hard to study because obviously</p>

17 (Pages 62 to 65)



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<p>1 asbestos has been widespread, you know.  2 But the estimate has been that it can be in  3 the order of one to two cases per million,  4 so 0.1, 0.2 on this scale.  5 Q. For people with -- the rate,  6 what's sometimes called the background rate  7 of mesothelioma in the absence of obvious  8 sources of asbestos exposure is on the  9 range of one to two cases per million  10 person years, correct?  11 A. Yes, I think that's the best  12 estimate we have.  13 Q. Okay. So the rate for Wood  14 County, Wisconsin is somewhere between 9 to  15 20 times higher than the background rate of  16 mesothelioma for people without any  17 asbestos exposure, correct?  18 A. Yes, absolutely, that's what we  19 can say for men anyway.  20 Q. For men. And for women you would  21 expect that the background rate for  22 mesothelioma would be in the same range as  23 it is for men, because by definition you're  24 talking about people without obvious or any  25 asbestos exposure, correct?</p>	<p>1 (Exhibit 9, Research Report dated  2 12/5/84, marked for identification.)  3 (Exhibit 10, Research Report of  4 Joseph Wendlick dated August, 1985,  5 marked for identification.)  6 Q. Do you have Exhibits 9 and 10 in  7 front of you, Dr. Boffetta?  8 A. Yes, I do.  9 Q. Are these documents that you've  10 seen before?  11 A. Yes. Certainly number 9; I think  12 I've seen also number 10.  13 Q. Number 9 is some air monitoring  14 done in 1984, correct?  15 A. Yes.  16 Q. And you see on the table 1 they  17 have asbestos fiber measurements in  18 Marshfield, Stevens Point and Stratford?  19 A. Yes, in different locations, yes.  20 Q. And this is 1984, so this is six  21 or 7 years after the Marshfield plant would  22 have ceased using asbestos, correct?  23 A. Yes, I think so.  24 Q. Okay, and when they went out and  25 did the air sampling, they found asbestos</p>
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<p>1 A. That's correct.  2 Q. Okay, and so if the background  3 rate for mesothelioma in women is .1 to .2  4 per 100 thousand, you would agree with me  5 that the rate of mesothelioma in Wood  6 County, Wisconsin for women is somewhere  7 between -- somewhere around eight times  8 higher than the background rate of  9 mesothelioma?  10 MR. McGUFFEY: Object to form.  11 A. Between three and eight.  12 Q. You did not -- you testified a  13 while ago you didn't do any ambient air  14 measurements in Wood County, Wisconsin or  15 close to the Marshfield plant or any at  16 all, correct?  17 A. This is correct.  18 Q. Okay, you have seen a couple of  19 reports by Weyerhaeuser employees where  20 they had done some measurements of  21 the ambient asbestos exposure, or what they  22 called ambient asbestos exposure at various  23 places in Wisconsin. Do you recall seeing  24 that as part of your work in this case?  25 A. Yes, I remember having seen this.</p>	<p>1 levels in Marshfield in a range between  2 .003 fibers per cubic centimeter and .008  3 fibers per cubic centimeter, correct?  4 A. Yes, this is correct.  5 Q. Alright, are you familiar with  6 the United States of America's  7 Toxicological Profile For Asbestos that was  8 published in 2001 that had estimates of --  9 not estimates, they had measurements of  10 ambient air collected from around the  11 country and came up with average ambient  12 air for the United States as it relates to  13 asbestos fiber?  14 A. Well, I don't remember this  15 particular document. There has been many  16 such measurements of ambient air.  17 (Exhibit 11, Report entitled  18 Toxicological Profile for Asbestos,  19 marked for identification.)  20 (Exhibit 12, ATSDR Report dated  21 September, 2001, marked for  22 identification.)  23 Q. And first of all, doctor, which  24 one did I mark 11 and which one did I mark  25 as 12?</p>

18 (Pages 66 to 69)



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<p>1 A. 11 is a few pages, and that's</p> <p>2 from the Toxicological Profile for Asbestos</p> <p>3 from the DHHS from 2001 from the ATSDR, and</p> <p>4 number 12 is, I think it's called</p> <p>5 Toxicology Profile, I don't know exactly</p> <p>6 the name. Anyway, it's a document also</p> <p>7 from ATSDR for asbestos, also dated 2001,</p> <p>8 toxicology profile.</p> <p>9 Q. Okay, do you recognize either of</p> <p>10 these documents?</p> <p>11 A. Well, I've seen these documents,</p> <p>12 this type of documents many times. I mean,</p> <p>13 I don't remember this particular document.</p> <p>14 Q. You understand what the ATSDR is,</p> <p>15 the Agency For Toxic Substances and Disease</p> <p>16 Registry in the United States. You've seen</p> <p>17 the publications that it's put out in your</p> <p>18 work as a professional epidemiologist,</p> <p>19 correct?</p> <p>20 A. Yes, I know what the ATSDR is.</p> <p>21 Q. And did you understand that in</p> <p>22 2001, among many other things that it did</p> <p>23 in this toxicological profile for asbestos,</p> <p>24 it collected data on ambient air exposure</p> <p>25 for asbestos in the United States? Do you</p>	<p>1 A. I'm sorry, on page?</p> <p>2 Q. Page 149, if you go -- you see</p> <p>3 towards the bottom of the page they're</p> <p>4 talking about the concentration of asbestos</p> <p>5 fibers in outdoor air are highly variable?</p> <p>6 It's about 3/4 of the way down on page 149.</p> <p>7 A. Yes, I see this.</p> <p>8 Q. Okay. And then four lines up</p> <p>9 from the bottom the ATSDR states that</p> <p>10 typical concentrations are 1 times 10 to</p> <p>11 the negative fifth PCM fibers per</p> <p>12 milliliters in rural areas and up to an</p> <p>13 order of magnitude higher in urban areas,</p> <p>14 do you see that?</p> <p>15 A. Yes.</p> <p>16 Q. Okay. So let's just get some</p> <p>17 definitions. Am I correct that a</p> <p>18 concentration of asbestos which is 1 times</p> <p>19 10 to the minus fifth fibers per milliliter</p> <p>20 is the same thing as 1 times 10 to the</p> <p>21 minus fifth of fibers per cubic centimeter?</p> <p>22 A. Yes, milliliters and cubic</p> <p>23 centimeter are the same thing.</p> <p>24 Q. And am I correct that the way</p> <p>25 numerically to express 1 times 10 to the</p>
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<p>1 recall that it did that?</p> <p>2 A. Oh, yes. Well, they've done many</p> <p>3 times, not only 2001.</p> <p>4 Q. Okay, and why don't we work with</p> <p>5 the summary. You recognize Exhibit 12 is a</p> <p>6 summary chart that was published at the</p> <p>7 same time as Exhibit 11? Exhibit 11 is</p> <p>8 only an excerpt from a much bigger, fatter</p> <p>9 book, right?</p> <p>10 A. Yes, this is correct.</p> <p>11 Q. The Toxicological Profile for</p> <p>12 Asbestos is one of the books that I have on</p> <p>13 my shelf in my library in my office. It</p> <p>14 would be about three or four inches thick</p> <p>15 if you printed it out, correct?</p> <p>16 A. Yes.</p> <p>17 Q. And it has multiple different</p> <p>18 sections. One of the sections talks about</p> <p>19 potential for human exposure to asbestos in</p> <p>20 the environment, correct?</p> <p>21 A. Yes, correct.</p> <p>22 Q. And on section 6.1 at page 149,</p> <p>23 I'm looking at the excerpt, and it's</p> <p>24 repeated again in Exhibit 12, I'm just</p> <p>25 going to ask you to look at them both.</p>	<p>1 negative fifth is 0.00001 fibers per cubic</p> <p>2 centimeter?</p> <p>3 A. Yes, that's correct.</p> <p>4 Q. And in the summary document which</p> <p>5 is the -- for lack of a better word -- more</p> <p>6 user friendly summary of the big fat book,</p> <p>7 could you turn to the second page of that,</p> <p>8 section 1.3, how one might be exposed to</p> <p>9 asbestos?</p> <p>10 A. Okay, I see this.</p> <p>11 Q. Okay, so about two thirds of the</p> <p>12 way down it says, for example, 10 fibers</p> <p>13 are typically present in a cubic meter of</p> <p>14 outdoor air in rural areas. Do you see</p> <p>15 that?</p> <p>16 A. Yes.</p> <p>17 Q. And then they do a conversion to</p> <p>18 convert cubic meters to fibers in a</p> <p>19 milliliter, correct?</p> <p>20 A. Yes.</p> <p>21 Q. And then what they go on to</p> <p>22 conclude is since there are one million</p> <p>23 cubic centimeters or one million</p> <p>24 milliliters in a cubic meter, there would</p> <p>25 typically be 0.00001 fibers per milliliters</p>

19 (Pages 70 to 73)

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<p>1 of asbestos in air in rural areas. Typical</p> <p>2 levels found in cities are about tenfold</p> <p>3 higher. Do you see that?</p> <p>4 A. Yes.</p> <p>5 Q. Okay, first of all, do you have</p> <p>6 any criticisms of the ATSDR's analysis of</p> <p>7 the amount of asbestos you would find in</p> <p>8 ambient air in rural America or in cities</p> <p>9 in America?</p> <p>10 MR. McGUFFEY: Object to the</p> <p>11 form; foundation.</p> <p>12 A. No, obviously I don't have any</p> <p>13 objection. I think these are data that</p> <p>14 refer to the 90s, I think. One should</p> <p>15 have to go back and look at when, you know,</p> <p>16 these measurements were done, because</p> <p>17 asbestos in particular in urban areas,</p> <p>18 asbestos exposure has gone down, following,</p> <p>19 you know, the phasing out of asbestos use</p> <p>20 in industry and consumer products, et</p> <p>21 cetera. So this most likely reflects -- I</p> <p>22 mean this reflects what are the</p> <p>23 concentration around 2000, and if we do it</p> <p>24 today it may even be lower in fact, at</p> <p>25 least in the urban areas.</p>	<p>1 MR. McGUFFEY: Object to form.</p> <p>2 A. Yes, that's what they say in a</p> <p>3 typical rural area or typical urban area.</p> <p>4 Q. And would you agree with me just</p> <p>5 as a mathematical fact the amount of</p> <p>6 ambient air measured in Marshfield in the</p> <p>7 mid-1980's is a couple of orders of</p> <p>8 magnitude higher than the asbestos that one</p> <p>9 would find typically in rural air in the</p> <p>10 United States as measured by the ATSDR?</p> <p>11 MR. McGUFFEY: Object to the</p> <p>12 form, foundation.</p> <p>13 A. It would be -- compared to rural</p> <p>14 area you said?</p> <p>15 Q. Yes.</p> <p>16 A. Yes, it would be two order of</p> <p>17 magnitude higher.</p> <p>18 Q. Yes. And just for the record, an</p> <p>19 order of magnitude is ten times, so two</p> <p>20 orders of magnitude is a hundred times?</p> <p>21 A. Yes, that's compared to a rural</p> <p>22 area.</p> <p>23 Q. And if one could do the exact</p> <p>24 math to figure out how much bigger .003 is</p> <p>25 than .000001, you could just do third grade</p>
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<p>1 Q. Are you certain that the data in</p> <p>2 the 2001 ASTDR Toxicological Profile for</p> <p>3 asbestos was based on measurements taken in</p> <p>4 the 90s, or could it perhaps be the case</p> <p>5 it was based on measurements taken in the</p> <p>6 70s and the 80s and compiled in the</p> <p>7 National Academy of Sciences in the 1984</p> <p>8 publication?</p> <p>9 A. This can be the case also. As I</p> <p>10 said, this may reflect the results that</p> <p>11 were available after 2001. I don't know</p> <p>12 exactly. I should go back and look at the</p> <p>13 report I think.</p> <p>14 Q. As you sit here today you don't</p> <p>15 know what the data sources are for the</p> <p>16 ATSDR publication in 2001?</p> <p>17 A. No, I don't remember this now.</p> <p>18 Q. Okay. You would agree with me</p> <p>19 that as of 2001, whatever those data</p> <p>20 sources were, the ATSDR was saying that the</p> <p>21 amount of asbestos in ambient air in the</p> <p>22 United States of America is .00001 fibers</p> <p>23 per cubic centimeter in rural areas, and in</p> <p>24 urban areas it would be 10 times higher,</p> <p>25 correct?</p>	<p>1 division, right?</p> <p>2 A. Yes, I think so.</p> <p>3 Q. So my fourth grade son ought to</p> <p>4 be able to figure that out?</p> <p>5 A. I suppose so, yes. I hope so.</p> <p>6 Q. Alright, I hope so too. He's</p> <p>7 getting A's in math, he'd better be able to</p> <p>8 do that.</p> <p>9 Alright, so would you agree with</p> <p>10 me that the ambient air as measured by</p> <p>11 Mr. Wendlick in Marshfield in 1984 is</p> <p>12 substantially higher than one would expect</p> <p>13 in someone who is not anywhere near any</p> <p>14 kind of point source of asbestos?</p> <p>15 MR. McGUFFEY: Object to the</p> <p>16 form, foundation.</p> <p>17 A. Yes. It depends really what</p> <p>18 typical means in this ATSDR terminology,</p> <p>19 because if for typical they mean without</p> <p>20 any source of asbestos, I would agree. But</p> <p>21 many cities would have a source of asbestos</p> <p>22 and that's the reason why it's higher,</p> <p>23 their estimate, I don't know exactly, but I</p> <p>24 would say yes, I would tend to agree with</p> <p>25 you.</p>

20 (Pages 74 to 77)

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<p>1 Q. Would you agree with me that one</p> <p>2 of the -- not exactly a problem, but one of</p> <p>3 the issues one has to confront when doing</p> <p>4 analytical epidemiology as it relates to</p> <p>5 environmental or occupational exposures to</p> <p>6 asbestos, is that it is difficult if not</p> <p>7 impossible to find a cohort of comparison</p> <p>8 of people who have never been exposed to</p> <p>9 asbestos in any way, shape or form?</p> <p>10 A. This is probably correct for</p> <p>11 studies done in industrial countries, yes.</p> <p>12 There has been studies done in other</p> <p>13 settings where comparisons were done with a</p> <p>14 population that were probably close to the</p> <p>15 sort of typical rural situation that we</p> <p>16 just discussed. But since most of the</p> <p>17 occupational studies are done in industrial</p> <p>18 areas, because by definition this is where</p> <p>19 the factories that used asbestos were</p> <p>20 located most of the time, it's that, you</p> <p>21 know, any other population that the area</p> <p>22 may have, some exposure either in other</p> <p>23 industries or in the general environment or</p> <p>24 in other settings, yeah. So I tend to</p> <p>25 agree if we talk about studies in the US or</p>	<p>1 was completed, and there you might have a</p> <p>2 lot of contamination, people who were</p> <p>3 taking the drug who stopped, people who</p> <p>4 have not taken the drug who started. So</p> <p>5 it's not as clear-cut as --</p> <p>6 Q. So you still have some of the</p> <p>7 same problems with observational</p> <p>8 epidemiology in cancer drug research?</p> <p>9 A. Yeah, in pharma epidemiology you</p> <p>10 have the same issue of exposure assessment</p> <p>11 to a large extent, unless you restrict your</p> <p>12 assessment to the clinical trial which is</p> <p>13 just a short typically two-year, three-year</p> <p>14 sort of thing.</p> <p>15 Q. And that's not going to tell you</p> <p>16 anything about disease risk or long-term</p> <p>17 latency effects?</p> <p>18 A. Exactly.</p> <p>19 Q. Okay. I noticed that you</p> <p>20 reviewed Dr. Parker, the industrial</p> <p>21 hygienist's report in your materials in</p> <p>22 this case, correct?</p> <p>23 A. Yes.</p> <p>24 Q. You also reviewed Dr. Henry</p> <p>25 Anderson's reports and opinions. You had</p>
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<p>1 Europe on these subjects.</p> <p>2 Q. I mean, just by way of example,</p> <p>3 you testified earlier today about one of</p> <p>4 the assignments you had done in litigation</p> <p>5 related to a diabetes drug that was alleged</p> <p>6 to cause kidney cancer, correct?</p> <p>7 A. Kidney cancer.</p> <p>8 Q. In the pharmaceutical field, you</p> <p>9 can do controlled -- and this is what they</p> <p>10 do, they do controlled clinical trials</p> <p>11 where one group of people is given the drug</p> <p>12 and another group of people is not given</p> <p>13 the drug, and so you can have a true</p> <p>14 comparison between someone who is unexposed</p> <p>15 to whatever it is in the drug that</p> <p>16 potentially is toxic as compared to people</p> <p>17 who were exposed, correct?</p> <p>18 A. Well, this is correct at the</p> <p>19 first level, but things are more</p> <p>20 complicated because clinical trials do not</p> <p>21 typically look for long-term effects like</p> <p>22 cancer risk, and long-term effects of</p> <p>23 drugs, for example, is to look at the</p> <p>24 experience of cancer in these different</p> <p>25 groups of patients after the clinical trial</p>	<p>1 certain criticisms of Dr. Anderson's</p> <p>2 reports and opinions, correct?</p> <p>3 A. Yes.</p> <p>4 Q. I didn't notice, and maybe I</p> <p>5 missed it, but did you have any specific</p> <p>6 criticisms of Dr. Parker, the industrial</p> <p>7 hygienist's report?</p> <p>8 MR. McGUFFEY: Objection to</p> <p>9 form. He is a mister.</p> <p>10 Q. Okay, Mr. Parker.</p> <p>11 A. No, I didn't really felt sort of</p> <p>12 experienced enough to get into specific</p> <p>13 criticism of an industrial hygienist's</p> <p>14 report.</p> <p>15 Q. So you focused your criticism on</p> <p>16 the medical/epidemiology testimony from</p> <p>17 Anderson and not the work of Dr. --</p> <p>18 Mr. Parker, the industrial hygienist,</p> <p>19 correct?</p> <p>20 A. That's what I was saying.</p> <p>21 Q. Okay. Were you ever provided</p> <p>22 with either the expert report or the</p> <p>23 pathology report or the testimony of a</p> <p>24 Dr. John Maddox?</p> <p>25 A. I don't remember this name now.</p>

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<p>1 It's possible that I --</p> <p>2 Q. I mean, I will represent to you I</p> <p>3 didn't see anything like that in your</p> <p>4 materials that you reviewed.</p> <p>5 A. I don't think so. I don't think</p> <p>6 I remember that.</p> <p>7 Q. I certainly didn't see</p> <p>8 Dr. Maddox's name or any of his work that</p> <p>9 appeared in Exhibit 3, which is your</p> <p>10 report. I admit I didn't do a word search</p> <p>11 of it, but am I correct based on your</p> <p>12 memory of your report and my memory of your</p> <p>13 report that you didn't discuss any of</p> <p>14 Dr. Maddox's opinions or conclusions in</p> <p>15 Exhibit 3?</p> <p>16 A. That's my recollection.</p> <p>17 Q. Okay, and so as you sit here</p> <p>18 today you don't have any understanding or</p> <p>19 knowledge or opinions or criticisms about</p> <p>20 anything Dr. John Maddox did in this case?</p> <p>21 A. That's correct.</p> <p>22 (Recess taken: 11:06-11:21 a.m.)</p> <p>23 FURTHER EXAMINATION BY MR. FINCH</p> <p>24 (Exhibit 13, Article by Paolo</p> <p>25 Boffetta in Med Lav 1998; 89,</p>	<p>1 correct?</p> <p>2 A. Yes.</p> <p>3 Q. And you're trying to solve for --</p> <p>4 well, you're not trying to solve for it.</p> <p>5 Describe for me what is K1 in the equation</p> <p>6 there. K1 is one of the variables in the</p> <p>7 equation you have on page 474. What is</p> <p>8 that?</p> <p>9 A. I'm not sure. You referred --</p> <p>10 Q. I'm just asking about the</p> <p>11 formula.</p> <p>12 A. Well, this is a formula for risk</p> <p>13 difference, and so the -- and for lung</p> <p>14 cancer, we're talking about lung cancer</p> <p>15 here. And it says that the risk difference</p> <p>16 is a function of the cumulative exposure</p> <p>17 which is CE, and a constant K, which is</p> <p>18 specific for type of industry, and then X,</p> <p>19 which is a number of expected cases of lung</p> <p>20 cancer. This is one of the formulas that</p> <p>21 was derived for lung cancer. I think is</p> <p>22 this is based on Peto, if I remember.</p> <p>23 This is 20 years ago. I took it from the</p> <p>24 in-serve report, but I think it is first</p> <p>25 originally from Peto. So basically it</p>
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<p>1 6:471-480, marked for identification.)</p> <p>2 Q. I'm going to put what's been</p> <p>3 marked Exhibit 13 in front of you, and tell</p> <p>4 me if you recognize it.</p> <p>5 A. Yes, this is a paper I published</p> <p>6 almost 20 years ago.</p> <p>7 Q. I have some questions about it.</p> <p>8 This was published in a peer-reviewed</p> <p>9 journal, is that right?</p> <p>10 A. Yes.</p> <p>11 Q. And it is a discussion of four</p> <p>12 different diseases associated with asbestos</p> <p>13 exposure?</p> <p>14 A. Yes, that's correct.</p> <p>15 Q. Alright. There is on page 474 a</p> <p>16 graphic, do you see that?</p> <p>17 A. Yes.</p> <p>18 Q. And am I correct that the numbers</p> <p>19 in parentheses on the graphic refer to</p> <p>20 various studies?</p> <p>21 A. Yes, I think these are a number</p> <p>22 of the references.</p> <p>23 Q. And so what this is, is a</p> <p>24 modeling of risk of lung cancer as a</p> <p>25 function of cumulative asbestos exposure,</p>	<p>1 shows that the risk difference depends on</p> <p>2 the rate on the rate of lung cancer, which</p> <p>3 is this expected number, the cumulative</p> <p>4 exposure and the type of industry, which</p> <p>5 somehow relates to the type of fiber</p> <p>6 probably. Anyway, this is a type of</p> <p>7 industry.</p> <p>8 Q. Okay. And then on page 475, you</p> <p>9 write that the available data, and the data</p> <p>10 you're talking about are epidemiological</p> <p>11 data, correct?</p> <p>12 A. I think so, yes.</p> <p>13 Q. The available data are consistent</p> <p>14 with the most widely accepted model of</p> <p>15 quantitative dose response between</p> <p>16 cumulative exposure to asbestos and lung</p> <p>17 cancer risk, which assumes a linear</p> <p>18 relationship with no threshold. That's</p> <p>19 what you wrote in 1998, correct?</p> <p>20 A. Yes, this was based on 1998 data,</p> <p>21 yes, absolutely.</p> <p>22 Q. And am I correct that the most</p> <p>23 widely accepted model of quantitative dose</p> <p>24 response between cumulative exposure to</p> <p>25 asbestos and lung cancer risk based on</p>

22 (Pages 82 to 85)



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<p style="text-align: right;">Page 86</p> <p>1 epidemiological studies still is a linear 2 relationship with no threshold? 3 A. Well, whether it would be still 4 valid today, this statement, well, it 5 depends what most widely means. Probably 6 yes, although I think the evidence about, 7 what I wrote here is no precise data are 8 available for very low exposure levels and 9 now I think we have more data compared to 10 what was available in 97-98 it when I wrote 11 this stuff, especially from new case 12 control studies. A few also from cohort 13 studies. So I would like -- I think 14 broadly speaking it's okay. I would need 15 to go back and review this more in detail I 16 think. 17 Q. Would the available 18 epidemiological data also be consistent 19 with a model of quantitative dose response 20 between cumulative exposure to asbestos and 21 mesothelioma risk, which assumes a linear 22 relationship with no threshold? 23 A. No, I think I discussed a 24 different model for mesothelioma. This is 25 what was for lung cancer.</p>	<p style="text-align: right;">Page 88</p> <p>1 mesothelioma risk? 2 A. Yes, for mesothelioma, yes, I 3 think the first 10, 20 years are very -- 4 are not very informative because one would 5 not expect to see a risk anyway. 6 Q. Wouldn't you agree that in order 7 for the true risk of mesothelioma in a 8 cohort to become evident over time, you 9 would want to see data followup for at 10 least 40 years? 11 A. Well, the longer you have, the 12 better. Probably yeah, 40 years is okay. 13 As I said here, we start to go up after 14 20 years, so 20, 30, 40, the more you wait, 15 the more informative the data become in a 16 way. 17 Q. Okay, and on page 477, this is 18 where you're talking about the quantitative 19 relationship between mesothelioma risk and 20 asbestos exposure? 21 A. Yes. 22 Q. Okay, and in layperson's terms, 23 explain what it is you're telling us here 24 on page 477. 25 A. You mean the formula?</p>
<p style="text-align: right;">Page 87</p> <p>1 Q. In your discussion of pleural 2 mesothelioma, you talk about, first of all 3 on page 476, the most widely accepted 4 figure for western countries is on the 5 order of one to two cases per million. 6 That's the background rate we were talking 7 about earlier, correct? 8 A. Yes. That's the same sort of 9 figures we discussed before. 10 Q. One factor which complicates the 11 investigation of mesothelioma risk among 12 asbestos exposed subjects in addition to 13 diagnosis, mixed classification, is the 14 variable on latency period between the 15 beginning of asbestos exposure and tumor 16 development. Mesotheliomas rarely occur 17 within the first 20 years since first 18 exposure and the risk is still elevated 40 19 or more years after first exposure. First 20 of all, do you still agree with that? 21 A. Yes, although we have now again 22 much more data on this compared to what we 23 had at that time. 24 Q. Do you agree that only cohorts 25 with a long followup are informative on</p>	<p style="text-align: right;">Page 89</p> <p>1 Q. Yes. 2 A. Here the formula is the incidents 3 of mesothelioma at a given time, is 4 proportionate to the latency, which is this 5 term T minus T-0 elevated to some power 6 which is between 3.54, and then related 7 linearly with the level of exposure which 8 is E, and again with some constant, some 9 factor that is related to probably the 10 different type of asbestos fibers. The 11 assumption here is that for lung cancer we 12 had the excess because we have a background 13 of lung cancer without asbestos. Here we 14 assume that all the incidents in asbestos 15 exposed workers comes from asbestos, so the 16 expected is basically zero in the one, so 17 the total incidents is equal to the excess. 18 That's why I didn't code it excess in this 19 case. 20 Q. Okay, and is there a level of 21 asbestos exposure -- let me ask it this 22 way. The dose response curve that you drew 23 for lung cancer based on various studies 24 shown in figure 1 is a no threshold model, 25 correct?</p>

23 (Pages 86 to 89)



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<p>1 A. Yes. This is based on the model 2 that I describe there. It is a no 3 threshold. 4 Q. Right. 5 A. Yes -- no, that's correct. 6 Q. What is the dose response curve 7 for mesothelioma? Is it also a no 8 threshold model? 9 A. Yes, based on this formula it 10 would be a non-threshold model. 11 Q. Okay, so it would -- just so 12 we're clear, this is Exhibit Number 13A. 13 (Exhibit 13A, Lined sheet with 14 handwriting, marked for 15 identification.) 16 Do you see Exhibit 13A, 17 Dr. Boffetta? 18 A. Yes. 19 Q. That's a no threshold dose 20 response curve for mesothelioma? 21 A. Yes, but this is incorrect. 22 Q. It's incorrect? 23 A. Absolutely. 24 Q. Why is it incorrect? 25 A. Because as I was trying to</p>	<p>1 very, very low and then we start to go up. 2 And then for different exposure levels you 3 have curves that are slightly higher or 4 slightly lower. 5 Q. But they all intersect with zero, 6 correct, for exposure? 7 A. Yes, sure, absolutely. So that's 8 sort of cognitive -- 9 Q. And what that implies is that 10 there is no level of asbestos exposure that 11 is considered to be insufficient to cause 12 mesothelioma in humans, correct? 13 A. Yes. This is the implication of 14 the known -- of the linear dose response. 15 As I said for the lung cancer, the data are 16 insufficient to separate this from the 17 model where there is a threshold, and again 18 for mesothelioma we basically don't see any 19 case in the first 20 years and we don't see 20 any case with very low exposure. So 21 whether is an excess, this is what the 22 model says, but you know, is not -- there 23 is no way we can -- the way we say it, 24 there is no way we can empirically test 25 this hypotheses.</p>
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<p>1 explain, because you relate the relative 2 risk, as I said this is total incidents. 3 You put cumulative incidents, and I said 4 there is no cumulative incidents in the 5 formula for mesothelioma. There is latency 6 and exposure level, and you put a linear 7 dose response, while the latency would have 8 a cubic or even higher level. So this -- 9 Q. Okay, so how would you draw the 10 dose response curve for mesothelioma using 11 that formula? You can just turn this over 12 on the back. 13 A. It depends whether you want to 14 relate it to latency or to exposure level, 15 to average exposure. 16 Q. Exposure. 17 A. It would be a linear dose 18 response, but the real way to do it would 19 be not this way, but would be to do it, you 20 know, a number of -- well, that's not the 21 right way to do it, sorry. You have to do 22 it really with latency, which is the key 23 factor here. The latency would go 24 something like this, and this would say 25 20 years or whatever, so this would be</p>	<p>1 Q. Okay, we'll get to the empirical 2 testing by epidemiology in a minute. 3 A. Okay. 4 Q. But I have a few more questions. 5 Keep that in the pile. It's an exhibit. 6 And I'll draw a big X across what Nate 7 drew. 8 A. Okay. 9 Q. So nobody gets confused. Nate. 10 And then just put your initials here, so 11 that anybody who reads the transcript will 12 know that -- 13 A. So that's really what I see. 14 This is effect of exposure and this is 15 effect of latency. 16 Q. And you drew -- the lines are 17 latency, what is this, incidence? 18 A. That's incidence. 19 Q. And if you drew a dose response 20 curve with -- you started to draw a dose 21 response curve, incidence and fiber 22 exposure, but you've crossed that out. 23 A. Yeah, because is -- if you ignore 24 latency, it makes no sense. That's what 25 I'm trying to say.</p>

24 (Pages 90 to 93)

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<p style="text-align: right;">Page 94</p> <p>1 Q. If you control for latency, isn't</p> <p>2 it the case though that as you have --</p> <p>3 A. Yes, and that's what you see</p> <p>4 here.</p> <p>5 Q. -- increasing risk?</p> <p>6 A. Yes, for the same latency, yes.</p> <p>7 Q. Okay, so if you were to draw a</p> <p>8 dose response curve for mesothelioma that</p> <p>9 has as this axis five years of exposure and</p> <p>10 this axis incidence and you're controlling</p> <p>11 for the same latency, am I correct that you</p> <p>12 would end up with a dose response curve</p> <p>13 that bisects zero?</p> <p>14 A. Yes, yes, sure.</p> <p>15 Q. Why don't you just draw that so</p> <p>16 people -- you don't want to draw it, I</p> <p>17 understand, but I just want to --</p> <p>18 A. Because it's misleading. I mean,</p> <p>19 if the latency is short, this will be the</p> <p>20 dose response.</p> <p>21 Q. I understand that? But the whole</p> <p>22 -- let's say you were talking about --</p> <p>23 A. If the latency is 40 years, this</p> <p>24 would be the dose response, or it would be</p> <p>25 probably even higher, I don't know.</p>	<p style="text-align: right;">Page 96</p> <p>1 A. Yes.</p> <p>2 Q. And for the dose response curve</p> <p>3 for mesothelioma, it bisects zero, correct?</p> <p>4 A. Yes, based on this thing. Again,</p> <p>5 we don't know really what is going on here</p> <p>6 in the low range.</p> <p>7 Q. Alright, you agree with me there</p> <p>8 have been some cohort -- not cohort, some</p> <p>9 case control epidemiology since 1998 that</p> <p>10 bears on this question of excess risk of</p> <p>11 mesothelioma at doses below one fiber cc</p> <p>12 year?</p> <p>13 A. Yes, I think there has been a few</p> <p>14 studies.</p> <p>15 Q. Okay, and I'll get to some of</p> <p>16 those in a minute. This paper also talks</p> <p>17 about Km on page 477.</p> <p>18 A. It talk about -- sorry?</p> <p>19 Q. Km on page 477.</p> <p>20 A. Yes.</p> <p>21 Q. Km is a, for lack of a better</p> <p>22 word, it is a constant that is estimated</p> <p>23 that is supposed to be a substitute for</p> <p>24 fiber potency among various cohorts?</p> <p>25 A. Yes, it's a sort of indicator or,</p>
<p style="text-align: right;">Page 95</p> <p>1 Q. Alright, but what --</p> <p>2 A. What I'm saying is the effect of</p> <p>3 level of exposure is more compared to the</p> <p>4 effect of latency and that's what I tried</p> <p>5 to show here.</p> <p>6 Q. Alright, understanding that, it</p> <p>7 is your view that the effect of latency</p> <p>8 dominates as compared to the cumulative</p> <p>9 exposure --</p> <p>10 A. To the level of exposure.</p> <p>11 Q. To the level of exposure. Am I</p> <p>12 also correct that if you hold latency</p> <p>13 constant across whatever cohorts you're</p> <p>14 looking at, as asbestos exposure rises,</p> <p>15 incidence of mesothelioma rises as well?</p> <p>16 A. Yes, and that's what I tried to</p> <p>17 draw here, showing here that for the same</p> <p>18 latency you have a higher -- this would be</p> <p>19 higher exposure and this would be lower</p> <p>20 exposure, so you have --</p> <p>21 Q. Right, but if you're holding</p> <p>22 latency constant at a given level of</p> <p>23 exposure, the more exposure you have, the</p> <p>24 more expected incidence of mesothelioma,</p> <p>25 correct?</p>	<p style="text-align: right;">Page 97</p> <p>1 yeah, factor for the different type of</p> <p>2 fibers and their potency.</p> <p>3 Q. And in 1998 you're writing that</p> <p>4 while the accepted values for Km are <math>1 \times 10</math></p> <p>5 to the minus 8 for pure chrysotile, <math>1.5 \times</math></p> <p>6 <math>10</math> to the minus 8 for mixed exposures and <math>3</math></p> <p>7 <math>\times 10</math> to the minus 8 for predominantly</p> <p>8 amphibole exposure, correct?</p> <p>9 MR. McGUFFEY: Object to the</p> <p>10 form.</p> <p>11 A. Yes, this is.</p> <p>12 Q. On page 478, am I correct that</p> <p>13 you called the mining region in Quebec an</p> <p>14 area of relatively high environmental</p> <p>15 asbestos pollution?</p> <p>16 A. Yes, this is what I wrote here.</p> <p>17 Q. Alright, and then you write at</p> <p>18 the conclusion paragraph, the risk, and</p> <p>19 you're talking about the risk of</p> <p>20 mesothelioma, the risk is about three times</p> <p>21 higher for amphiboles as compared to</p> <p>22 chrysotile, do you see that?</p> <p>23 A. Yes, this refers to this Km, which</p> <p>24 was three, four predominant amphiboles.</p> <p>25 Q. Okay, is it still your view that</p>

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<p>1 the risk for mesothelioma for amphiboles is</p> <p>2 about three times higher than the risk for</p> <p>3 chrysotile?</p> <p>4 A. I haven't reviewed the data</p> <p>5 recently, so I don't know whether this --</p> <p>6 if you put all the data together we have</p> <p>7 today, we still come up with three. I</p> <p>8 think the notion that it's higher for</p> <p>9 amphiboles stays whether it would be three,</p> <p>10 it would be more than three, it would be</p> <p>11 less than three, I don't know.</p> <p>12 Q. Okay, so as you sit here today</p> <p>13 you don't have an opinion about whether the</p> <p>14 fiber potency for the amphiboles is two</p> <p>15 times higher than chrysotile, four times</p> <p>16 higher than chrysotile, 20 times higher</p> <p>17 than chrysotile. You wrote in 1998 it was</p> <p>18 three, but you haven't looked at the</p> <p>19 data recently enough to have a different</p> <p>20 opinion, is that correct?</p> <p>21 A. For mesothelioma, yes, I think</p> <p>22 three is an estimate that was used at that</p> <p>23 time. It would be interesting to review</p> <p>24 the data and see whether it is still the</p> <p>25 best estimate or whether we have any better</p>	<p>1 A. Yes, this is what was available</p> <p>2 when we wrote the paper in 2011 I think or</p> <p>3 whatever.</p> <p>4 Q. Okay, alright, so and some of</p> <p>5 these papers obviously predate your 1998</p> <p>6 article, correct? Like the Canadian gas</p> <p>7 mask of Donald McDonald since 1978.</p> <p>8 A. Yes, absolutely.</p> <p>9 Q. Alright, and you would agree with</p> <p>10 me that since the publication of this</p> <p>11 paper, there have been a handful of</p> <p>12 additional papers relating to some of these</p> <p>13 cohorts, is that correct? Updates of some</p> <p>14 of these cohorts?</p> <p>15 A. Yes, and also some new cohorts,</p> <p>16 yes, I think.</p> <p>17 Q. There have been maybe four or</p> <p>18 five new cohorts have been described in the</p> <p>19 literature and three or four updates to</p> <p>20 these cohorts?</p> <p>21 A. More updates, and more -- maybe</p> <p>22 three, four, five new cohorts mainly from</p> <p>23 China if I remember.</p> <p>24 Q. Yeah, my -- obviously we're not</p> <p>25 going to spend the time to go through every</p>
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<p>1 data now.</p> <p>2 Q. Okay, let's see -- you can set</p> <p>3 that one aside.</p> <p>4 (Exhibit 14, 2012 British Journal</p> <p>5 of Cancer Article by McCormack, Peto</p> <p>6 et al., marked for identification.)</p> <p>7 (Exhibit 15, 2013 British Journal</p> <p>8 of Cancer Letter to the Editor, marked</p> <p>9 for identification.)</p> <p>10 I'm going to hand you 14 and 15</p> <p>11 because they go together. Let me know when</p> <p>12 you have Exhibit 14 and 15 in front of you,</p> <p>13 Dr. Boffetta.</p> <p>14 A. I do have it.</p> <p>15 Q. Okay, 14 and 15 are two papers</p> <p>16 that you were co-authors on, correct? 14</p> <p>17 is a paper and 15 is a reply to somebody's</p> <p>18 comment on the paper, correct?</p> <p>19 A. That's correct.</p> <p>20 Q. And am I correct that in table 1</p> <p>21 in the papers, what you and your co-authors</p> <p>22 have done, have collected, what is pretty</p> <p>23 much every cohort study ever been done on</p> <p>24 cohorts of workers or populations exposed</p> <p>25 to various types of asbestos?</p>	<p>1 paper in the universe, but this -- if I</p> <p>2 wanted to start with all of the cohort</p> <p>3 studies have been done on asbestos exposed</p> <p>4 populations, this list in Exhibit 14 is a</p> <p>5 pretty good collection of them as of 2011,</p> <p>6 correct?</p> <p>7 MR. McGUFFEY: Object to form.</p> <p>8 A. Yes, although table 1</p> <p>9 comprises all the cohorts that have had</p> <p>10 data on lung cancer and mesothelioma.</p> <p>11 There have been a few more cohorts that</p> <p>12 maybe did a report of this data, so we did</p> <p>13 not -- could not include them.</p> <p>14 Q. But this is your attempt to</p> <p>15 collect the cohort studies that have data</p> <p>16 on lung cancer and mesothelioma, correct?</p> <p>17 A. Yes, that's probably correct.</p> <p>18 Q. And would you agree with me</p> <p>19 generally that some of these cohort studies</p> <p>20 had contemporaneous measurements of</p> <p>21 asbestos exposure but many of them did not?</p> <p>22 A. Yes, I would agree on that.</p> <p>23 Q. And would you agree that one of</p> <p>24 the reasons that it's complicated or</p> <p>25 perhaps impossible to tease out fiber</p>

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<p>1 potency differences as between the 2 amphiboles and chrysotile is there's just 3 not enough studies with good 4 contemporaneous asbestos exposure data to 5 allow one to do the exercise? 6 A. Yes, I would say this is true for 7 many of the cohorts, and what we did in 8 this paper as in other papers was to try to 9 classify the cohorts according to one 10 asbestos type or one asbestos fiber type or 11 mixed unknown if this was not available, 12 and that's what is written also in this 13 table. But I agree. 14 Q. And am I correct that one of the 15 things that you and your authors did here 16 was take the various fiber type cohorts and 17 come up with a mesothelioma deaths per one 18 thousand non-asbestos related deaths and 19 then compare those figures across the 20 different types of cohorts. You did that 21 on table 3, right? 22 A. Yes, per thousand deaths, yes, 23 and then the ratio with the lung cancer 24 deaths. 25 Q. Alright, and we did a ratio for</p>	<p>1 A. Yes, has limitations, but yes. 2 Q. And so if someone were to rely on 3 this for attempting to estimate the fiber 4 potency differences between the various 5 asbestos minerals as compared to mixed 6 fiber exposures, would that be a reasonable 7 thing for a doctor or an epidemiologist to 8 do, knowing all the limitations and the 9 fact that we don't have good 10 contemporaneous exposure data for all the 11 cohorts that went into your paper? 12 A. Well, I would prefer to do it by 13 comparing the incidence of these cohorts of 14 mesothelioma, not the ratio between the 15 number of deaths and the known -- and the 16 other deaths. What we use this ratio here 17 to make then the transfer into the lung 18 cancer story, because the paper is really 19 about lung cancer, not about mesothelioma. 20 Q. Okay. 21 A. But to answer your question to 22 really estimate what the difference of the 23 different asbestos types is, I would rather 24 rely on the data of the incidence of 25 mesothelioma with different cohorts.</p>
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<p>1 lung cancer deaths, we also did a ratio per 2 one thousand non-asbestos related cancer 3 deaths in the second column, correct? 4 A. Yes. 5 Q. And you divided those up into 6 one, two, three, four, five different rows 7 based on the type of asbestos fiber in the 8 cohorts you were talking about, correct? 9 A. Yes, that's the same 10 classification that we had in table one. 11 Q. Okay, and so based on the data in 12 this paper, would you agree with me that 13 what this suggests is that for the disease 14 mesothelioma, chrysotile is about 20 to 15 25 times more likely than chrysotile to 16 result in mesothelioma and about four times 17 more likely and amosite to result in 18 mesothelioma? 19 MR. McGUFFEY: Object to the 20 form. 21 A. Yes, this would be an 22 interpretation of the data, keeping in mind 23 what we said before, that this 24 classification is inexact. 25 Q. Inexact?</p>	<p>1 Q. Okay, and the incidence of 2 mesothelioma in the different cohorts you 3 can find by looking at table number 1, 4 correct? 5 A. No, that's my point. We only had 6 the number of deaths here, and then this 7 ratio between number of meso and then other 8 deaths, et cetera. 9 Q. No, but I'm looking at table one. 10 Don't you have for each study the number of 11 mesothelioma deaths -- 12 A. Yeah, but the incidence is the 13 number over the number of person years in 14 the cohort. 15 Q. Ah, okay, I see what you're 16 talking about. You're talking about a 17 calculated incidence rate. 18 A. Yes. 19 Q. As opposed to number of deaths. 20 A. Yes, sorry, yes. 21 Q. I understand, alright. Okay, so 22 bottom line there is you haven't gone back 23 and analyzed the data that exists today and 24 tried to make a determination whether your 25 statement in 1998 that the amphiboles are</p>

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<p>1 three times more potent than chrysotile is,  2 correct or incorrect?  3 A. No, I've not.  4 Q. Okay. And you recognize that  5 there are different people, different  6 experts both medical doctors and  7 epidemiologists that come out with widely  8 different opinions on what is the different  9 on a fiber basis between the amphiboles and  10 chrysotile, correct?  11 A. Yes, for mesothelioma.  12 Q. Yes.  13 A. Yes, I think so.  14 Q. And would you agree with me that  15 in general when those analyses are done on  16 a fiber per fiber basis, there is very  17 little data to draw a distinction between  18 chrysotile and amosite as compared  19 between the amphiboles generally and  20 chrysotile specifically?  21 MR. McGUFFEY: Object to form.  22 A. I think the major difficulty to  23 separate chrysotile from amphiboles, be  24 they chrysotile or amosite -- obviously  25 there are many cohorts that are mixed or</p>	<p>1 A. Okay, I was looking at the  2 previous paragraph. Yes.  3 Q. This is entirely consistent with  4 the IARC classification of chrysotile as a  5 group 1 carcinogen to humans, IARC 2012.  6 At no point do we conclude that  7 mesothelioma occurring in chrysotile  8 exposed cohorts is due to other asbestos  9 types. Rather we considered it valid to  10 discuss that when multiple carcinogenic  11 fibers are present, the relevant  12 contribution of each is more difficult to  13 disentangle. You wrote that back in 2012  14 or 2013?  15 A. Yes.  16 Q. Do you still agree with that?  17 A. Oh, yes, absolutely.  18 Q. Do you agree with me that when we  19 were talking about specifically chrysotile  20 and chrysotile exposed cohorts and exposure  21 to other asbestos types, the relevant  22 contribution of each fiber type is more  23 difficult to disentangle than if you're  24 just exposed to one fiber alone, correct?  25 MR. McGUFFEY: Object to form.</p>
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<p>1 unknown and they use both. I mean, if I  2 remember when we did this paper, and then  3 you know, some other paper on try to look  4 at asbestos type, the real issue that many  5 cohorts use chrysotile and some amphiboles,  6 and this can be one or the other or both.  7 That's where I found most difficult. And  8 this is somehow reflected here, because you  9 see there is a category for chrysotile and  10 chrysotile, because really we were not --  11 and this represent a bunch of different,  12 you know, proportion probably.  13 Q. Turn to Exhibit 15. Do you have  14 that? This is a reply to a comment that  15 the journal received about the paper we  16 were just looking at in Exhibit 14. And I  17 want to focus you on a statement that you  18 and your co-authors write in the right  19 column. Do you see where it says on the  20 carcinogenicity of chrysotile, our article  21 clearly shows that there are both excesses  22 of mesothelioma and lung cancer associated  23 with chrysotile, do you see that?  24 A. No, but I have no problem --  25 Q. Right here.</p>	<p>1 A. This is what I was trying to say  2 before.  3 Q. Okay, do you agree with me that  4 the human body doesn't know the source of  5 the asbestos that it is breathing in on a  6 cellular and physiological level?  7 MR. McGUFFEY: Object to the  8 form.  9 A. Sorry, I'm not sure I understand  10 your question.  11 Q. So you agree with me that people  12 can breathe in asbestos while they are on  13 the job, right?  14 A. Sure.  15 Q. They can breathe in asbestos if  16 they live in a neighborhood close to a  17 point source of asbestos pollution like a  18 factory that makes asbestos containing  19 products?  20 MR. McGUFFEY: Object to the  21 form.  22 A. Yeah, they can be exposed to  23 asbestos, sure.  24 Q. Right. They can also be exposed  25 to asbestos if somebody brings asbestos</p>

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<p style="text-align: right;">Page 110</p> <p>1 dust home on their work clothes and 2 contaminates the home, correct? 3 A. Well, yes, sure, if the exposure 4 is high, they will be exposed. 5 Q. Alright, my question is, does the 6 human body from a biologic cellular end, 7 physiological perspective, know the 8 difference of the source of the asbestos? 9 A. I'm not sure how to understand 10 your question. But if you say that the 11 human body reacts or responds in a 12 different way to the different asbestos 13 fibers, I would say that probably this is 14 true at the lung level where I think 15 chrysotile is less biopersistent than the 16 amphiboles. What happens in the pleura is 17 less known so I don't have an answer to 18 your question. What I know, that when 19 people exposed to asbestos, mixed asbestos 20 or different types, their lung tissue is 21 analyzed, typically the majority of the 22 fibers or in some cases the only type of 23 fibers found are amphiboles, although there 24 was exposure to chrysotile also. So if 25 this -- I don't know whether this is an</p>	<p style="text-align: right;">Page 112</p> <p>1 is from a biological perspective in the 2 lung, does the human body respond any 3 differently to the asbestos fibers that are 4 breathed in inside the plant versus a 5 quarter of a mile away from the plant 6 versus inside the home? 7 MR. McGUFFEY: Objection to 8 form. 9 Q. Holding the type of fiber -- 10 A. Yeah, no, if you talk about 11 different sources of exposure, obviously 12 there is no way to separate this once they 13 are in the body. 14 Q. And is it also therefore true 15 that when you're talking about trying to 16 assess the relative contribution to an 17 individual person's asbestos disease, I'm 18 not talking about epidemiology in 19 populations, but an individual person, it 20 is difficult to disentangle the 21 contributions of asbestos exposure from 22 different places at different times as 23 compared to they've only been exposed to 24 asbestos at one place at one time. 25 MR. McGUFFEY: Object to form.</p>
<p style="text-align: right;">Page 111</p> <p>1 adequate answer to your question because I 2 don't know what you mean by the body knows 3 But in terms of response at the lung level, 4 I'm saying, not at the pleural level, there 5 seems to be clearly a difference between 6 the way that the lung is able to eliminate 7 or dissolve or whatever chrysotile fibers 8 compared to amphibole fibers. And this may 9 relate to the different carcinogenic 10 potency. 11 Q. Alright, my question was a little 12 bit -- I apologize, because I was asking 13 that question after just showing you an 14 article we were talking about, chrysotile 15 versus the amphiboles. My question wasn't 16 based on the differences between fibers. 17 A. Ah, okay. 18 Q. I want you to assume in my 19 hypothetical that the fiber type at issue 20 is a mixture of amphiboles and chrysotile, 21 and there are three different sources of 22 exposure. There is exposure inside a 23 factory, there is an exposure living a half 24 mile away from the factor, and then there 25 is an exposure inside a house. My question</p>	<p style="text-align: right;">Page 113</p> <p>1 A. Well, no. From -- I'm repeating, 2 I mean, you can apply this epidemiological 3 formula and look at the different level of 4 cumulative exposure, for example, if you 5 talk about lung cancer or latency and level 6 of exposure, if you talk about 7 mesothelioma, and you can get a 8 quantification that is epidemiologically 9 based, so it's not precise at the 10 individual level, but gives a sort of 11 indication at the group level or what will 12 be the contribution of the different 13 sources. This can be done, so I tend to 14 disagree with your statement. 15 Q. So you're saying that you can do 16 it, and did you do that here in your work 17 in the -- 18 A. You mean in my report? 19 Q. Yes. 20 A. No, I didn't do it for these 21 plaintiffs. I don't remember. 22 Q. You did or did not? 23 A. I don't think I did. 24 Q. What you did is you criticized 25 Dr. Anderson's attempt to do that, correct?</p>

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<p>1 A. Yes, and then I provide some 2 risk, relative risk estimates, but not a 3 sort of individual quantification of what 4 will be the contribution of exposure A 5 versus exposure B or whatever. 6 (Exhibit 16, Rodelsperger, et al. 7 article in American Journal of 8 Industrial Medicine, marked for 9 identification.) 10 (Exhibit 17, Lacourt, et al. 11 article from Thorax Online, marked for 12 identification.) 13 (Exhibit 18, Jiang, et al. 14 article from BD Biosciences.com, 15 marked for identification.) 16 Q. The first question is very 17 simple, Dr. Boffetta. Have you ever seen 18 any of these three papers before? 16 is 19 Rodelsperger published in the American 20 Journal of Industrial Medicine; 17 is 21 Lacourt published in Thorax in 2014; and 22 the third one is a patient by -- the lead 23 author, I have no idea how to pronounce it, 24 I'm just going to wing it and say Jiang in 25 the International Journal of Cancer it</p>	<p>1 estimate the asbestos exposure level of the 2 people that are involved in the study? 3 A. Well, I remember this is what was 4 done in the French, for the study in 5 Lacourt, and for the German study I would 6 need to go back, but probably you are right 7 that they used those industrial hygiene 8 estimates. 9 Q. Okay, so however they did it, 10 both of these studies, both Exhibit 16 and 11 Exhibit 17, they came up with estimates of 12 cumulative exposure, you know, fiber cc 13 years or fiber milliliter years basis at 14 various levels and then compared the risk 15 of disease at those different exposure 16 levels, correct? 17 A. Yes, that's what they did. 18 Q. And you were talking earlier 19 about you couldn't recall or you weren't 20 sure whether there were epidemiological 21 studies dealing with risk of mesothelioma 22 at fiber levels in the .3 to .5 fiber cc 23 years range. Do you recall very early in 24 this deposition you and I had a discussion 25 about that?</p>
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<p>1 looks like in late -- well, two different 2 years, 2017 or 2018. And my question is, 3 have you ever seen any of these case 4 control studies before? 5 A. I've seen the first two, I've not 6 the last one. 7 Q. Okay. 8 A. The new one, the Chinese one. 9 Q. Alright, so you've seen the 10 Rodelsperger 2001 and Lacourt 2014 papers 11 before? 12 A. Yes. 13 Q. And am I correct that both of 14 these are case control studies relating to 15 the concept of pleural mesothelioma and 16 asbestos exposure? 17 A. Yes. 18 Q. And in reading those studies they 19 have quantified the risk of mesothelioma at 20 various cumulative exposure levels in the 21 paper, correct? 22 A. Yes, that's what they've done. 23 Q. Okay, and in both of these 24 papers, am I correct that what they did is 25 they had expert industrial hygienists</p>	<p>1 MR. McGUFFEY: Object to form. 2 A. Yes. 3 Q. Okay. Now, looking at the 4 Rodelsperger paper, would you agree with me 5 that each time they're measuring in table 6 seven, they have measured the risk of 7 mesothelioma at various levels of 8 cumulative exposure up to a particular 9 cutoff point, do you see that? 10 A. In table 7, yes. 11 Q. Yes. And so for example in the 12 cumulative exposure up to the end of 13 observation they use the people who are, 14 quote, not exposed as the baseline, right? 15 A. Yes, that's what they did. 16 Q. That has an odd ratio of one 17 because they don't see any cases in that 18 group, correct? 19 A. There are 11 cases in that group. 20 Q. Sorry, there are 11 cases in that 21 group and they use an odds ratio of -- what 22 does an odds ratio of one mean? 23 A. It means that the odds in the 24 reference category, so the other odds are 25 calculated relative to these odds. So it's</p>

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<p>1 a ratio of odds, odds ratio. So the odds 2 for the second category is 7.5 times higher 3 than the level in the first category. 4 Q. Okay, so the odds of the second 5 category is for anybody exposed greater 6 than zero up to 0.15 fiber cc years, 7 correct? 8 A. Yes, that's what the table says. 9 Q. And that results in an odds ratio 10 of 7.9? 11 A. Yes, this is correct, for 12 example. 13 Q. With a confidence interval of 2.1 14 to 30 which does not span one, correct? 15 A. That's correct. 16 Q. Okay, so what that means is that 17 in this study for people exposed to 18 asbestos at a cumulative level of greater 19 than zero but less than 0.15 fiber cc 20 years, they had an excess risk of 21 mesothelioma that was statistically 22 significant? 23 A. In this table that's what it 24 shows. 25 Q. Okay, and then as the exposure</p>	<p>1 Q. Are there any cohort studies that 2 have good enough exposure data at the 3 lowest levels of exposure to estimate the 4 risk at low levels? 5 A. Well, one would have to go back 6 and look. That's possible, but these are 7 not exposure levels, these are estimates, 8 numbers made up by the industrial 9 hygienist. 10 Q. Well, isn't that true of most of 11 the cohort studies, you don't have 12 contemporaneous air sampling measurement? 13 We just talked about that 20 minutes ago. 14 A. No, many do have. No, I didn't 15 say that. Many do have measurements. Many 16 cohort studies have historical 17 measurements. 18 Q. Okay, we'll get to that in a 19 minute. Would you agree with me that the 20 Lacourt study is another case control 21 epidemiology study that shows an excess 22 risk of mesothelioma at exposure levels 23 less than 0.1 fiber milliliter year? 24 A. Yes, these are the results. But 25 I mean, this is a terrible study. They</p>
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<p>1 level goes up, the odds ratio increases as 2 well, at least until you get to the 15 3 fiber cc year mark, correct? 4 A. Yes, this is correct. 5 Q. Alright, would you agree with me 6 that this is one of the newer -- it's not 7 that new any more, but this is an 8 analytical epidemiology study that shows a 9 statistically significant excess risk of 10 mesothelioma to mixed asbestos fiber 11 exposures greater than zero and less than 12 0.15 fibers cc years? 13 A. Well, face value, yes, but I 14 don't think these results are valid. 15 Q. You don't -- why don't you think 16 the results are valid? 17 A. They have a very low response 18 rate in controls, so there is a lot of bias 19 in case control studies. I don't think we 20 can use case control studies for this. 21 Q. You don't think you can use case 22 control studies to -- 23 A. For mesothelioma to estimate of 24 the effect of asbestos. You need to rely 25 on cohort studies.</p>	<p>1 draw cases from one -- from two different 2 sources of control from two other sources. 3 It's something that is totally against 4 epidemiological methodology, this French 5 study. The German study is okay, it simply 6 has all the limitations of a normal case 7 control study. The French study is 8 nonsense to me. 9 Q. Okay, so -- 10 A. They look at cases from PNSM, I 11 was a chair of the scientific element of 12 this program, I know it very well, and the 13 controls from general populations from -- 14 and the participation rate was 61 percent 15 in cases 20 percent in controls. How can 16 you rely on this data? The percent means 17 that four out of five controls that were 18 asked to participate did not participate. 19 Q. So you have criticisms of the 20 French study, but suffice it to say it's 21 published in a peer-reviewed medical 22 journal and it shows what it shows, 23 correct? 24 A. That's correct. 25 Q. And the German study you don't</p>

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<p>1 have the same criticisms, but you don't 2 believe it's a valid way to estimate 3 mesothelioma risk at various levels of 4 exposure? 5 A. Well, response rate in the German 6 study was 60 percent. So it's better than 7 the French study, but it's still pretty 8 bad, I have to say. It means that you can 9 have a lot of bias because you don't know 10 who are the people who don't participate in 11 your controls, so how can you compare the 12 cases that are all the cases you have in 13 the control that you missed, half of them 14 or 40 percent of them. 15 Q. Do you believe that mesothelioma 16 is a signal tumor for asbestos exposure? 17 A. Well, I would say so at least in 18 industrial societies, yes. 19 Q. Would you agree with me that when 20 reading medical journal articles, if you 21 see a case of mesothelioma and there is 22 discussion and the discussion of that 23 person's case a documented history of 24 asbestos exposure, the reader of the 25 article if they're a doctor or an</p>	<p>1 scientifically speaking, at that time. So 2 -- but sure, this was the first study that 3 showed this strong risk in people exposed 4 to, in particular in the South African 5 miners. 6 Q. Right, and that study was not a 7 cohort study or a case control study, it 8 was a case series, right? 9 A. Absolutely, absolutely. When you 10 have a very strong carcinogen, you don't 11 need cohort studies. You need cohort 12 studies when you want to quantify the level 13 of risk obtaining minute differences, like 14 those people are trying to do here. That's 15 what I'm saying. 16 Q. Okay, do you agree with me there 17 is a substantial amount of medical 18 literature that demonstrates people have 19 developed mesothelioma years after working 20 with asbestos containing products for as 21 short a duration as a day to a few days? 22 MR. McGUFFEY: Object to form. 23 A. Oh, absolutely, and that's 24 exactly my point I said before, that for 25 mesothelioma, latency is important and not</p>
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<p>1 epidemiologist would be justified in 2 concluding that the mesothelioma was a 3 result of the asbestos exposure in that 4 case control -- I mean that case series or 5 case report? 6 A. Well, this is a reasonable 7 conclusion, but you just pointed to this 8 study and they have 10 percent of the cases 9 they say there was no asbestos exposure 10 there, so this may not be the case for -- 11 this assumption may not hold for all the 12 cases. 13 Q. Would you agree with me that 14 mesothelioma came to the attention of the 15 world scientific literature with the 16 publication of Wagner's paper in 1960? 17 A. That's probably true, yeah, 18 although there were reports that this is 19 where, you know, the story came out. 20 Q. And what people concluded based 21 on that publication was that at least 22 African asbestos caused mesothelioma, from 23 that Wagner paper? 24 A. Well, I don't know what people 25 concluded at that time. I wasn't around,</p>	<p>1 duration. That's exactly what I was 2 saying. 3 Q. Okay, and so you would agree with 4 me that -- 5 A. So cumulative exposure which 6 contains drift. 7 Q. So if somebody spent a day sawing 8 up asbestos cement sheds that resulted in 9 an occupational level exposure and they 10 developed mesothelioma many years later, 11 that could be an asbestos caused 12 mesothelioma? 13 A. Well, as I said before, I don't 14 know about the one day story. I know that 15 the studies that showed an effect for short 16 duration were such as women employed during 17 World War II in the gas mask manufacture, 18 they worked several months at very high 19 level of exposure. This is where the short 20 duration story comes from. I've never seen 21 a study showing an effect for one-day 22 duration. I'm not saying that is totally 23 impossible, but I'm saying when people talk 24 about short duration and they say short 25 duration may cause mesothelioma, I refer to</p>

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<p style="text-align: right;">Page 126</p> <p>1 those studies that talk about six months, 2 one year or whatever, you know. 3 Q. Okay, but you haven't gone back 4 to look through all the medical literature 5 to find case series or case reports of 6 short duration exposure to asbestos 7 resulting in mesothelioma, have you, sir? 8 A. No, I have not. Short duration, 9 you mean one day or something? 10 Q. One day, three days, five days. 11 You haven't collected that literature or 12 analyzed that literature? 13 A. No. 14 Q. And the British gas mask studies, 15 just so we're clear, you've got them listed 16 in Exhibit 14, the paper -- 17 A. Yeah, is number 2 on table 1, for 18 example. 19 Q. Number 2 on table 1. 20 A. And maybe also number 3 if I 21 remember, probably both of them. 22 Q. Okay. Since I asked you about 23 it, and I highlighted the part I want to 24 draw your attention to. This is 25 Exhibit 19.</p>	<p style="text-align: right;">Page 128</p> <p>1 Q. And then the odds ratio for 2 living within a mile of a potential source 3 before 30 years of age was not 4 statistically significant, correct? 5 A. Yes. 6 Q. Alright. So for purposes of, I 7 guess, Mr. Spatz's case, if his father -- 8 you would agree with me that his father, by 9 the definitions of this paper, Mr. Spatz's 10 father was a potentially exposed worker at 11 the Marshfield plant, correct? 12 MR. McGUFFEY: Object to the 13 form. 14 A. Well, yes, if he works -- yeah, 15 he worked during that period when the 16 product was used, although he was not 17 involved, so I don't know how relevant his 18 exposure was. There is potentially in a 19 very general sense, I would agree. 20 Q. Right. And then you would agree 21 with me that Mr. Spatz, the person who 22 developed mesothelioma, lived with his 23 father before he was 30 years of age? 24 A. Well, I assume so, yes. I didn't 25 review that aspect, so --</p>
<p style="text-align: right;">Page 127</p> <p>1 (Exhibit 19, Rake, et al. article 2 on the British Journal of Cancer, 3 marked for identification.) 4 Okay, this was the Rake Peto 5 study we were talking about earlier, is 6 that right? 7 A. Yes, indeed. 8 Q. And here am I correct, they're 9 looking at occupational exposure to 10 asbestos as well as certain aspects of 11 non-occupational exposure, right? 12 A. Yes, this is correct. 13 Q. And they find that -- well, two 14 things that are relevant for the Kilty and 15 Spatz cases. We'll go to the second one 16 first. I'm on page 1178, page 5 out of 10. 17 Are you there, with the highlighting? 18 A. Yes. 19 Q. They write "The only significant 20 non-occupational association was living 21 with a potentially exposed worker before 30 22 years of age," and then they produced the 23 odd ratio in the 95 percent confidence, do 24 you see that? 25 A. Yes.</p>	<p style="text-align: right;">Page 129</p> <p>1 Q. Alright, and so taking those two 2 parameters into account, they would fit 3 within the people, at least in this Rake 4 Peto study, that were at elevated risk of 5 mesothelioma, someone who was -- lived with 6 a potentially exposed asbestos worker 7 before the age of 30 years. 8 A. No, I don't agree, because this 9 analysis refers only to people without 10 occupational exposure, as can you see in 11 table 6. There is no comparable results 12 for people who also had occupational 13 exposure. 14 Q. So because they didn't tease -- 15 A. Well, they did tease out the 16 occupational exposure, and that's exactly 17 what I'm trying to say, that these are the 18 risk of the ratio 2, refers to domestic 19 exposure before 30 years, among those with 20 known occupational exposure. So it doesn't 21 apply to this patient, I think. 22 Q. I guess here's my question. If 23 you have a type of asbestos exposure that 24 is demonstrated to create an excess risk of 25 mesothelioma in a non-occupationally</p>



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<p style="text-align: right;">Page 130</p> <p>1 exposed person, why if the person is later  2 occupationally exposed does the risk that's  3 created prior to their occupation go away?  4 A. Because the additional  5 contribution would be minimal compared to  6 what they had from the occupational  7 exposure. That's the point. So the only  8 -- this data do not show to me that  9 somebody who has occupational exposure by  10 having residential or domestic or household  11 would further increase the risk. And I  12 would like to see these results before  13 agreeing with you, and this is not what the  14 data say. In fact I think all the people,  15 most of the people, or all the people who  16 have been looking at these, occupational  17 versus non-occupational exposure, look at  18 the non-occupational exposure only in --  19 sorry, look at the non-occupational  20 exposure residential household, et cetera.  21 Only in those without occupation, the  22 assumption is that in the occupational  23 exposed people, the risk comes from their  24 occupational exposure, and there is no way  25 you can detect any additional risk because</p>	<p style="text-align: right;">Page 132</p> <p>1 as it's used in testimony in American  2 asbestos cases is not a purely medical or  3 epidemiological term, it's a combination  4 quasi-medical quasi-legal?  5 A. Well, I don't have any experience  6 in testifying in litigation of asbestos so  7 I cannot answer your question. I don't  8 know what they use the word for.  9 Q. You have never testified in an  10 asbestos case in the United States,  11 correct?  12 A. That's correct.  13 Q. Have you done any work for any  14 asbestos defendants other than  15 Weyerhaeuser?  16 A. As I told you in this railway  17 company, asbestos was one of the agents  18 being discussed. But I doubt you can say  19 that railway is an asbestos industry. If  20 it is, I wasn't involved in this type of  21 thing.  22 Q. Have you been hired to serve as  23 an expert witness by, you know, American  24 car companies or brake manufacturers, for  25 example?</p>
<p style="text-align: right;">Page 131</p> <p>1 the amount of exposure would be minimal  2 compared to what they got from the job.  3 Q. So it's a function of -- you're  4 saying the risk would be minimal because  5 the dosage is minimal compared to the  6 occupational exposure dosage?  7 A. Sure. I mean, we said that dose  8 is one of the components of the risk of  9 mesothelioma, and when we talk about levels  10 in the order of 0.001 or whatever compared  11 to 1 or 10, it's two or three order of  12 magnitude. So --  13 Q. Have you calculated a fiber years  14 exposure level for either Mr. Kilty or  15 Mrs. Spatz from any source?  16 A. No, I told you before.  17 Q. Okay. Is the term "substantial  18 contributing factor" a term that you use in  19 the practice of medicine or epidemiology?  20 A. Well, if you want to quantify the  21 contribution of different factors, yes, you  22 can use it, although I don't know exactly  23 what substantial means in this context.  24 Q. Okay, so you would agree with me  25 then that "substantial contributing factor"</p>	<p style="text-align: right;">Page 133</p> <p>1 A. No.  2 Q. Have you been hired to serve as  3 an expert witness by companies that make  4 asbestos-containing gaskets or joint  5 compounds?  6 A. No.  7 Q. Have you been hired as an expert  8 witness in asbestos cases in the United  9 States by any companies other than  10 Weyerhaeuser as you sit here today?  11 A. As I said before, no, unless you  12 want to consider asbestos was considered in  13 railway --  14 Q. In the Norfolk &amp; Southern  15 Railway.  16 A. Yes.  17 Q. Norfolk &amp; Southern Railway is a  18 railroad that --  19 A. Yeah, there was an issue that  20 these workers or in general railway workers  21 can be exposed to asbestos, so that was my  22 involvement in discussing asbestos.  23 (Recess taken: 12:21-12:34 p.m.)  24 FURTHER EXAMINATION BY MR. FINCH:  25 (Exhibit 20, Marsh et al. article</p>

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<p>1 in Occupational Environmental Medicine 2 marked for identification.) 3 Q. This is Exhibit 20, it's the 4 Marsh paper. This is one of the papers you 5 cite in your expert witness statement; is 6 that right Dr. Boffetta? 7 A. Yes. 8 Q. As you sit here today, do you 9 have any major criticisms of the Marsh 10 meta-analysis entitled "Non-occupational 11 exposure to asbestos and risk of pleural 12 mesothelioma?" 13 A. Well, I better not have any major 14 criticism, because they consider this as an 15 update of a previous paper we wrote. But 16 yes, I think it was a good review and 17 meta-analysis of the studies on 18 occupational exposure to asbestos. 19 Q. And it attempts to quantify the 20 risk in various types of non-occupational 21 situations from neighborhood or household, 22 correct? 23 A. Yes, correct. 24 Q. And some of it they do by fiber 25 types and some they do by the source of</p>	<p>1 from either neighborhood exposure or 2 household exposure, that all of the 3 subjects were also not exposed to asbestos 4 occupationally? 5 MR. McGUFFEY: Object to the 6 form. 7 A. No, this is not correct. There 8 are people from the Casale group, I mean 9 from people who work with the Casale 10 population that look at environmental 11 exposure, non-occupational exposure in 12 people exposed occupationally and this is 13 the only result I found that looked at the 14 effect of non-occupational exposure in 15 people exposed occupationally. 16 Q. And that paper found that there 17 was an increased risk? 18 A. No. Well, in fact they did not 19 really report the results. When I 20 separated the case and controls I found no 21 increased risk. I did the analysis myself 22 using the data they reported in the table. 23 Q. Okay, and so the -- 24 A. But apart from the Casale papers, 25 I think all the other papers as far as I</p>
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<p>1 exposure? 2 A. That's correct. They try to look 3 at both. 4 Q. In this paper, did they do 5 anything to attempt to control for the 6 possibility that some of the neighborhood 7 cases or the domestic cases also had 8 exposure in the occupational setting? 9 A. No, I don't think they did this. 10 But as I said, most of these results which 11 I know are based on people without 12 occupational risk exposure. But they did 13 not do it, I think. 14 Q. They didn't do anything to 15 control for the risk of occupational -- 16 they didn't do anything to control for the 17 possibility of occupational exposure in any 18 of the subjects in any of the studies, 19 correct? 20 MR. McGUFFEY: Object to form. 21 A. As far as I remember this is 22 correct, yes. 23 Q. And is it your testimony that 24 every epidemiological study that has 25 measured an elevated risk of mesothelioma</p>	<p>1 remember did not look at occupational 2 exposed people. They were non-occupational 3 exposed as far as I remember. I may be 4 wrong in a few, but I don't think so. 5 Q. So it's your testimony that other 6 than the Italian paper, the Casale paper, 7 every other paper that demonstrated an 8 excess risk of mesothelioma from either 9 neighborhood exposure or non-occupational 10 domestic exposure, that the studies did 11 something to control for the possibility of 12 asbestos exposure in the workplace? 13 MR. McGUFFEY: Object to form. 14 A. As I said, I don't remember 15 whether all the studies did it, but all the 16 good studies did. I mean, these studies, 17 they typically separate the exposures and 18 they look at environmental exposure only in 19 those without occupational exposure. 20 Q. Okay, let's just -- since you've 21 been talking about the Casale paper, let's 22 make this 20A. That's the Ferrante paper, 23 2015, that you were just talking about? 24 A. I think so. Yes, exactly, that's 25 the one.</p>

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<p>1 (Exhibit 20A, Ferrante et al. 2 paper of 2015, marked for 3 identification.) 4 Q. And in the abstract or in the box 5 beside the abstract, the authors, whoever 6 wrote in the box what this paper adds, is 7 it not correct that they state, "A 8 cumulative exposure trend in the risk of 9 pleural malignant mesothelioma was observed 10 with increasing non-occupational exposure 11 as well as occupational exposure?" 12 A. Yes. 13 Q. And isn't it true that the 14 analysis that you did for your report in 15 this case where you attempted to 16 disentangle the occupational risk from the 17 non-occupational risk, that's never been 18 published anywhere in the peer reviewed 19 literature, correct? 20 A. Yes, correct. 21 Q. Are you aware of any publication 22 in the peer reviewed literature that 23 attempted to disentangle the occupation 24 from the non-occupational risk? 25 A. No. And as I said, I think these</p>	<p>1 and scientific judgment to apply to 2 different studies to different situations 3 than it would be if you were examining a 4 paper dealing with the speed of particles 5 at the speed of light in physics, correct? 6 MR. McGUFFEY: Object to form. 7 A. I would agree with that. 8 Q. Alright. Have you ever heard of 9 the Helsinki criteria, what is commonly 10 called the Helsinki criteria, it was 11 published in the Scandinavian Journal of 12 Work Environment, "Asbestos, asbestosis and 13 cancer, the Helsinki criteria for diagnosis 14 and attribution," have you ever heard of 15 that? 16 A. Yes, there are two versions of 17 that. 18 Q. I'm talking about the 2014 19 version. 20 A. Yes. Well, I know both. 21 (Exhibit 21, Helsinki Criteria 22 paper, marked for identification.) 23 Q. 21 is the Helsinki criteria. 24 Were you involved in any way in drafting 25 the attribution criteria in either Helsinki</p>
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<p>1 studies, they look at both together in a 2 way. 3 Q. Okay. You agree with me that any 4 medical doctor of epidemiology analyzing 5 asbestos epidemiology studies and comparing 6 the different situations necessarily has to 7 apply his or her own expertise and 8 experience and judgment to that task, 9 correct? 10 MR. McGUFFEY: Object to the 11 form, foundation. 12 A. Well, yes, in general this is 13 correct. 14 Q. I mean, it's not a discipline 15 like physics, where you know, for example, 16 that the speed of light in a vacuum is 186 17 thousand miles per second. You can't go to 18 a cookbook somewhere and say this is 19 exactly the way you have to analyze 20 epidemiology studies, correct? 21 A. Yes, I think there is more room 22 for -- because observation and discipline 23 is not experimental, so there is more room 24 for interpretation. 25 Q. There's more room for judgment</p>	<p>1 documents? 2 A. No, I was not. 3 Q. Do you have any criticisms of the 4 attribution criteria in the Helsinki as it 5 relates to Mesothelioma? 6 A. No, I think it was a relatively 7 good summary, I would say. 8 (Exhibit 22, La Vecchia and 9 Boffetta article, marked for 10 identification.) 11 Q. Do you recognize Exhibit 22? 12 A. Yes. 13 Q. This is a paper that you and 14 Carlo La Vecchia published in 2012? 15 A. That's correct. 16 Q. And in that paper you stated that 17 the work was conducted with the 18 contribution of the Italian Association for 19 Cancer Research and that there were no 20 conflicts of interest? 21 A. Yes, correct. 22 Q. And am I correct that this paper 23 generated, for lack of a better word, a fair 24 amount of controversy in the medical and 25 epidemiological literature?</p>

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<p>1 A. Well, I don't know whether it's</p> <p>2 in the literature. There were several</p> <p>3 people who were not happy with this paper,</p> <p>4 let me put it this way.</p> <p>5 Q. Okay, there was a published</p> <p>6 criticism of this paper that came out,</p> <p>7 correct?</p> <p>8 A. There was a letter to the journal</p> <p>9 and then there was a sort of paper</p> <p>10 published by the Collegium Ramazzini at</p> <p>11 some point.</p> <p>12 Q. And you responded to the</p> <p>13 Collegium Ramazzini in the American Journal</p> <p>14 of Industrial Medicine, you and Mr. La</p> <p>15 Vecchia wrote a response?</p> <p>16 A. Yes.</p> <p>17 (Exhibit 22A, Response published</p> <p>18 in American Journal of Industrial</p> <p>19 Medicine, marked for identification.)</p> <p>20 Q. That's the response that you</p> <p>21 wrote to the Collegium Ramazzini?</p> <p>22 A. Okay, yeah, this is the Collegium</p> <p>23 paper, yes. It came four years later after</p> <p>24 our paper.</p> <p>25 Q. Okay. Now, and what is 22A, sir?</p>	<p>1 but anyway --</p> <p>2 Q. Now, Exhibit 22, am I correct</p> <p>3 that the central thrust of this paper is</p> <p>4 that recent exposure to asbestos does not</p> <p>5 increase the risk of mesothelioma?</p> <p>6 A. Well, I would not put it this</p> <p>7 way. What we say, that the contribution of</p> <p>8 recent exposure is less important than the</p> <p>9 contribution of exposure in the past, which</p> <p>10 is consistent with this power to the third</p> <p>11 or the fourth for latency that we discussed</p> <p>12 before.</p> <p>13 Q. Is it your testimony that</p> <p>14 asbestos exposures more than 10 years prior</p> <p>15 to the diagnosis of mesothelioma but less</p> <p>16 than 20 years prior to the diagnosis of</p> <p>17 mesothelioma don't contribute in any way to</p> <p>18 the risk of mesothelioma in an asbestos</p> <p>19 exposed person?</p> <p>20 MR. McGUFFEY: Object to the</p> <p>21 form.</p> <p>22 A. Sorry, say that -- more than</p> <p>23 ten --</p> <p>24 Q. More than 10 and less than 20.</p> <p>25 A. Well, we have two ways to reply</p>
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<p>1 A. It is -- I think it's only our</p> <p>2 response.</p> <p>3 Q. That's your response?</p> <p>4 A. Yes.</p> <p>5 Q. And going back to Exhibit 22, in</p> <p>6 the acknowledgments and conflict of</p> <p>7 interest, first of all, you would agree</p> <p>8 with me that the acknowledgments statement</p> <p>9 in Exhibit 22 was not correct, right?</p> <p>10 A. The acknowledgment to the Italian</p> <p>11 Association For Cancer Research, well, it's</p> <p>12 debatable. First of all, the grant with</p> <p>13 the Italian Association was with Dr. La</p> <p>14 Vecchia, not with me, so I have nothing to</p> <p>15 do with this. Second, Dr. La Vecchia had a</p> <p>16 sort of umbrella grant from the Italian</p> <p>17 Association to study a number of cancers</p> <p>18 and he sent this paper to the Italian</p> <p>19 Association with the acknowledgment and</p> <p>20 they were happy when they received it at</p> <p>21 that time. So whether he used some of the</p> <p>22 money to do this work, I don't know,</p> <p>23 because as I said, I was not the person in</p> <p>24 charge of this grant. I know that people</p> <p>25 were criticizing La Vecchia and saying --</p>	<p>1 to this question. The first is based on</p> <p>2 the risk model that I discussed before, the</p> <p>3 contribution would be very small compared</p> <p>4 to other exposure, but there would be some</p> <p>5 small contribution. Based on the data</p> <p>6 available from the cohort studies, there is</p> <p>7 very little evidence that indeed there is a</p> <p>8 risk. But as we said before, it is very</p> <p>9 difficult to distinguish between a small</p> <p>10 risk and no risk. So I think the two</p> <p>11 are -- so if there is a risk, it is small I</p> <p>12 would say.</p> <p>13 (Exhibit 23, Erratum published in</p> <p>14 European Journal of Cancer Prevention,</p> <p>15 2015, 24:68, marked for</p> <p>16 identification.)</p> <p>17 Q. Okay now this is Exhibit 23. Can</p> <p>18 you tell me what Exhibit 23 is, sir?</p> <p>19 A. It's the erratum that we</p> <p>20 published in the journal where we published</p> <p>21 this paper in 2015.</p> <p>22 Q. And in this erratum you state</p> <p>23 that in the original paper where you stated</p> <p>24 there are no conflicts of interest, in the</p> <p>25 erratum you state, the authors would like</p>

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<p>1 to bring to the reader's attention the</p> <p>2 conflicts of interest for their review</p> <p>3 paper, and it goes on to say that Boffetta</p> <p>4 has acted as an expert witness for the</p> <p>5 defendants in a criminal trial involving</p> <p>6 exposure to asbestos in the manufacture of</p> <p>7 synthetic polymers and risk of</p> <p>8 mesothelioma, right?</p> <p>9 A. Yes.</p> <p>10 Q. So you were testifying as an</p> <p>11 expert for executives of an Italian company</p> <p>12 that was criminally charged with causing</p> <p>13 mesothelioma to workers, correct?</p> <p>14 A. Yes.</p> <p>15 Q. And at the time you were</p> <p>16 testifying -- and am I correct that a</p> <p>17 defense in that case was that the executive</p> <p>18 should not be responsible because the</p> <p>19 exposures that happened under their watch</p> <p>20 were later in time than the earlier</p> <p>21 exposures that these workers had?</p> <p>22 A. Well, I think so, that was part</p> <p>23 of it, yes.</p> <p>24 Q. Alright, and so at the same time</p> <p>25 you were testifying for these Italian</p>	<p>1 Italian criminal case?</p> <p>2 A. As I said, we wrote the erratum</p> <p>3 for this reason.</p> <p>4 Q. Other than your testimony for the</p> <p>5 executives in the criminal trial in Italy</p> <p>6 involving asbestos exposure in</p> <p>7 mesothelioma, have you ever testified in</p> <p>8 any case where the issue of asbestos</p> <p>9 exposure causing mesothelioma was in</p> <p>10 dispute?</p> <p>11 A. Well, there was a second trial</p> <p>12 with the same company that I was involved</p> <p>13 also, after.</p> <p>14 Q. So there were two cases in Italy?</p> <p>15 A. Two trials, yes.</p> <p>16 Q. Two trials in Italy. And who</p> <p>17 retained you in those cases, the executives</p> <p>18 or the company?</p> <p>19 A. No, the company. I mean, the</p> <p>20 lawyers representing the company.</p> <p>21 Q. And what was the name of the</p> <p>22 company?</p> <p>23 A. Edison. It's written there.</p> <p>24 Q. Edison. And approximately how</p> <p>25 much were you compensated total for the two</p>
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<p>1 executives of an asbestos company that was</p> <p>2 criminally charged, that they were</p> <p>3 criminally charged with killing workers</p> <p>4 with mesothelioma, you published this paper</p> <p>5 that essentially says that recent asbestos</p> <p>6 exposures don't increase the risk of</p> <p>7 mesothelioma, correct?</p> <p>8 MR. McGUFFEY: Object to the</p> <p>9 form.</p> <p>10 A. Well, I don't think it was at the</p> <p>11 same time. If I remember correctly, we</p> <p>12 published the paper after that. So in a</p> <p>13 way we started to look at this data because</p> <p>14 of the trial, and then we sort of put the</p> <p>15 whole thing in a better shape and did a</p> <p>16 more thorough analysis, et cetera, and we</p> <p>17 published the paper. That's why we felt</p> <p>18 that there was no conflict of interest,</p> <p>19 because it was not done for the paper. But</p> <p>20 anyway, we should have probably written</p> <p>21 this testimony thing.</p> <p>22 Q. Don't you think it was important</p> <p>23 for readers of this paper to know that the</p> <p>24 work that goes into it arose out of your</p> <p>25 role as a paid expert for executives in the</p>	<p>1 trials?</p> <p>2 A. The first time maybe 10 thousand</p> <p>3 euros; and the second time I don't</p> <p>4 remember, maybe 15 thousand euros.</p> <p>5 Q. Let's mark this as -- this was</p> <p>6 Exhibit 23, right?</p> <p>7 A. Yes, 23.</p> <p>8 Q. Let's mark this next Exhibit 24.</p> <p>9 (Exhibit 24, Curriculum Vitae,</p> <p>10 marked for identification.)</p> <p>11 Dr. Boffetta, you are at the</p> <p>12 Icahn School of Medicine at Mount Sinai?</p> <p>13 A. Yes.</p> <p>14 Q. And how long have you had an</p> <p>15 affiliation with Mount Sinai?</p> <p>16 A. Since 2010.</p> <p>17 Q. How much of your time do you</p> <p>18 spend here as opposed to in Italy?</p> <p>19 A. Well, I am full-time here. I go</p> <p>20 to Italy for collaborations and other</p> <p>21 things.</p> <p>22 Q. Now, in your biography, it says</p> <p>23 that you work at the Tisch Cancer</p> <p>24 Institute?</p> <p>25 A. That's correct.</p>



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<p style="text-align: right;">Page 150</p> <p>1 Q. Do you know who established the 2 Tisch Cancer Center? 3 A. I'm not sure. I think it was -- 4 his family gave a grant to Mount Sinai. 5 Q. Do you know who James Tisch is? 6 A. Well, I met him once. He is a 7 wealthy person who has been giving money to 8 different medical institutions. I don't 9 know the details. 10 Q. He was the CEO of the Loews 11 Corporation, do you know that? 12 A. No, I don't think I know this. 13 Q. Did you know that his company 14 owned Lorillard Tobacco Company before it 15 merged with R.J. Reynolds? 16 A. No, I didn't know these details. 17 I remember somebody working at Memorial at 18 some point mentioned that Tisch was 19 involved in tobacco manufacturing in the 20 past, but I don't remember these names. 21 Q. In your opinion does smoking 22 cigarettes cause lung cancer? 23 A. I think I have more than a 24 hundred papers on this issue, so the answer 25 is yes.</p>	<p style="text-align: right;">Page 152</p> <p>1 different types of additives in the 2 cigarettes? 3 A. I think so. I think I would 4 agree to that. 5 Q. Okay, are you of the view -- you 6 understand when I say secondhand smoke or 7 sidestream smoke, you know what that is? 8 A. Yes, I think I have about 50 9 papers on this topic, so I know this pretty 10 well. 11 Q. What is your opinion today as to 12 whether second hand or sidestream smoke can 13 cause lung cancer in humans? 14 A. Well, I think it has been shown 15 in many epidemiology studies that exposure 16 to secondhand smoke causes lung cancer. 17 The exact shape of the dose response, and a 18 few other aspects are still a bit unclear, 19 like you know the temperature aspects, 20 et cetera. But clearly secondhand smoke 21 can cause lung cancer; may cause lung 22 cancer, I mean to say. 23 Q. You believe that it is 24 epidemiologically established that 25 secondhand smoke can cause lung cancer in</p>
<p style="text-align: right;">Page 151</p> <p>1 Q. Okay, do you agree with me that 2 modern manufactured cigarettes, if you 3 smoke them enough, cause lung cancer, 4 correct? 5 A. Yes. 6 Q. Do you need to have a brand 7 specific epidemiology study of Camels or 8 Marlboros or Parliaments in order to draw 9 the conclusion that if somebody smokes two 10 packs a day of Camels for 20 years and 11 developed lung cancer, that it's a smoking 12 related lung cancer? 13 MR. McGUFFEY: Object to form. 14 A. No, I don't think so. Well, in 15 fact I tried to look into this issue in the 16 past to look at the different potency of 17 different brands of stuff, you know, but 18 obviously they are all carcinogenics. 19 Whether they are exactly the same risk, I 20 don't know. But yeah, sure. 21 Q. So in your view, you don't need 22 to have a cigarette band specific study in 23 order to relate lung cancer to smoking that 24 brand of cigarettes, even though cigarette 25 brands have different types of tobacco and</p>	<p style="text-align: right;">Page 153</p> <p>1 human beings? 2 A. Yes. 3 Q. And would you agree with me that 4 the study -- there have been multiple 5 studies that looked at that specific issue? 6 A. About 60 of them. 7 Q. Right. And my understanding of 8 those studies is that the relative risk of 9 lung cancer from sidestream smoke basically 10 falls in a range of somewhere around 1.115 11 to 1.38. I mean, is that consistent with 12 your -- 13 MR. McGUFFEY: Object to the 14 form, foundation. 15 A. I think the best estimates are 16 around, let's say for people who had 17 continuous exposure for a long time, 18 et cetera, the best estimate is in the 19 order of 1.25, probably 1.25 to 1.3, so it 20 will be in this range. Obviously if you 21 look at individual studies, the range is 22 much bigger obviously. 23 Q. Okay. Was there ever a time when 24 you did not believe that the evidence had 25 been established that sidestream or</p>

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<p>1 secondhand smoke caused lung cancer?</p> <p>2 A. Well, certainly before I started</p> <p>3 to do this work I didn't have an opinion,</p> <p>4 and then I was responsible for one of the</p> <p>5 largest studies ever done on this topic</p> <p>6 which was published in 98, and this, when I</p> <p>7 started it work on that study I started to</p> <p>8 review the data and I started to dig into</p> <p>9 this issue, and already at that time I</p> <p>10 think the evidence was quite strong, and</p> <p>11 then there has been obviously many more</p> <p>12 results after our study, which sort of</p> <p>13 makes the whole thing even stronger.</p> <p>14 Q. Just for the record, let's mark</p> <p>15 this as 24A, what you and I were looking</p> <p>16 at. I don't think anybody's going to look</p> <p>17 at that again, but let's just do it for the</p> <p>18 record.</p> <p>19 (Exhibit 24A, Lined sheet with</p> <p>20 handwritten notations, marked for</p> <p>21 identification.)</p> <p>22 (Exhibit 25, Response to email</p> <p>23 dated February 8, 2000, marked for</p> <p>24 identification.)</p> <p>25 Q. Do you have Exhibit 25 in front</p>	<p>1 A. I think 2009.</p> <p>2 Q. And why did you cease being</p> <p>3 affiliated with IARC?</p> <p>4 A. Well, because I had been there</p> <p>5 for 20 years and I was looking for</p> <p>6 different opportunities for me in my</p> <p>7 career. I've been offered jobs for many</p> <p>8 years, and at that point I decided to</p> <p>9 accept the job at Mount Sinai.</p> <p>10 Q. Looking at this exhibit, I think</p> <p>11 it's Exhibit 25, it's a discussion about</p> <p>12 contacts that the authors of an IARC paper</p> <p>13 on sidestream smoke had had with the</p> <p>14 tobacco industry, do you see that?</p> <p>15 A. Yes, I see.</p> <p>16 Q. What knowledge do you have of the</p> <p>17 tobacco industry contacting the authors of</p> <p>18 papers on sidestream smoke?</p> <p>19 A. At that time, well, obviously I</p> <p>20 don't remember all the details now, but I</p> <p>21 remember that there were several -- I think</p> <p>22 there were several of them, people linked</p> <p>23 to the tobacco industry, to -- not really</p> <p>24 to influence the study, but at least to</p> <p>25 know what was going on. So we had at IARC</p>
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<p>1 of you?</p> <p>2 A. Yes.</p> <p>3 Q. This is a response to an email</p> <p>4 that you received some time in 2000. And</p> <p>5 just so you know, I obtained this from the</p> <p>6 tobacco legacy website, which collects</p> <p>7 documents turned over in litigation.</p> <p>8 First of all, at the time you</p> <p>9 wrote this, were you the chief of the IARC</p> <p>10 Unit of Environmental Cancer Epidemiology?</p> <p>11 A. Yes, this was the time I think</p> <p>12 because I see the date. There is no date</p> <p>13 for my response, but I assume it was around</p> <p>14 the same time.</p> <p>15 Q. At some point you stopped being</p> <p>16 the Chief of the Environmental Cancer</p> <p>17 Epidemiology for IARC, is that correct?</p> <p>18 A. Yes, thinks change, you know the</p> <p>19 structure changed so there were different</p> <p>20 names.</p> <p>21 Q. Do you still have an affiliation</p> <p>22 with IARC?</p> <p>23 A. No, I don't.</p> <p>24 Q. When did you cease being</p> <p>25 affiliated with IARC?</p>	<p>1 visits for some people, some people who</p> <p>2 eventually I discovered they were connected</p> <p>3 with the tobacco industry, I didn't know</p> <p>4 when they came to talk to me about the</p> <p>5 study. And as I say here, at that time I</p> <p>6 knew that some of the collaborators in this</p> <p>7 study -- this was a multi-centered study</p> <p>8 for European countries. Some of these</p> <p>9 people had also been approached by a</p> <p>10 similar consultant. That's all I know.</p> <p>11 But as I wrote here, and this is still my</p> <p>12 recollection now, I mean, I don't think</p> <p>13 there was any real possibility to make any</p> <p>14 influence on that.</p> <p>15 Q. Did any tobacco collaborators, as</p> <p>16 you put it, approach you or talk to you?</p> <p>17 A. As I said, afterwards I</p> <p>18 discovered that at least two people who</p> <p>19 contacted me when we were doing the study</p> <p>20 were sort of linked to the tobacco</p> <p>21 industry. Do you want the names of --</p> <p>22 Q. Yeah, sure, what were the names?</p> <p>23 A. One is a professor from Italy who</p> <p>24 was called Giuseppe Dojacono, and he passed</p> <p>25 away many years ago. He is somebody I knew</p>

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<p>1 from my time in Italy and he was Professor 2 of Health Economics I think or something in 3 Rome, and I sort of knew him so he came a 4 few times just saying that he was in 5 France, and then he was asking what the 6 study was about, when we were going to 7 publish. And eventually I discovered that 8 he was reporting back to the tobacco 9 industry. And the second one is Dr. Peter 10 Lee, who has been working with the tobacco 11 industry for many years, and in fact he 12 came much more openly. I knew that he was 13 attending for some other issue and he asked 14 me to talk to me about the study. But at 15 least for Peter Lee, I knew that he was 16 sort of connected with the tobacco industry 17 and I think this is what I say here. You 18 see in parentheses, it says as we have been 19 at IARC, that's what I referred to I think 20 at that time. 21 Q. Okay, could you go back to 22 Exhibit 23. 23 A. Yes. 24 Q. Under consulting, it's the 25 website from Mount Sinai. 24. I got the</p>	<p>1 A. Well, I've been involved in 2 helping designing some studies for example. 3 We did a reanalysis of a study of 4 formaldehyde, for example. They had the 5 data from an NCI study and I was sort of 6 involved in helping them design the 7 analysis and discussing the results, et 8 cetera, and similar work. 9 Q. Did any of the work you did for 10 Environ relate to asbestos? 11 A. No. 12 Q. What is Eni S.p.A.? 13 A. Eni is the largest Italian 14 private company. They do oil, like Exxon. 15 Q. They're like an oil and gas 16 company? 17 A. Yes, oil and gas. 18 Q. This company was responsible for 19 an oil spill affecting the Fylde Coast of 20 Blackpool in the United Kingdom last 21 summer? 22 A. Possibly. I have no idea. They 23 are global, so I think they do all sorts of 24 things. 25 Q. What work have you done with</p>
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<p>1 exhibit numbers wrong. What was 23, by the 2 way? 3 A. It was the erratum. 4 Q. Alright, got it. 24, back to the 5 website. 6 A. Yes. 7 Q. On the last page it says, below 8 are financial relationships with industry 9 reported by Dr. Boffetta during 2017 and/or 10 2018. And then you have consulting in 11 Environ Global, Eni S.p.A. and Exponent. 12 A. Yes. 13 Q. those are financial -- you have 14 had financial relationships with each of 15 those entities in the past year or two? 16 A. I think it was in 2016 because 17 this is what we had to put it in February 18 so I have to put it now for the new year. 19 So this is what I put last year for 2016. 20 Q. Okay. Environ is a consulting 21 company? 22 A. Well yeah, they do studies and 23 consulting, yes. 24 Q. And what type of work did you do 25 for them?</p>	<p>1 them? 2 A. I'm involved in a litigation in 3 Italy on malformation in an area where they 4 had a big refinery plant and then at some 5 point a chemical plant. But I had just to 6 prepare -- I was working with a group of 7 other experts to prepare some reports. 8 Q. The litigation involving this 9 industrial facility in Italy? 10 A. Yes, it's a civil litigation. In 11 in fact it's not in litigation. It's what 12 they call, there is a statement in the 13 Italian system, it's a preliminary 14 statement where people try to find an 15 agreement or whatever, so we were just, you 16 know, consulting for the company for that. 17 Q. Did that involve asbestos in any 18 way? 19 A. No, not that I know. 20 Q. Exponent is a consulting firm in 21 the United States? 22 A. Yes, absolutely. 23 Q. You have published papers with 24 other Exponent consultants on various 25 chemicals?</p>

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<p>1 A. Yes.</p> <p>2 Q. One of the papers you published</p> <p>3 for Exponent was on dioxin?</p> <p>4 A. Yes, that's correct.</p> <p>5 Q. You disagreed that dioxin should</p> <p>6 be classified as a known human carcinogen</p> <p>7 by IARC?</p> <p>8 A. Well, my disagreement was on the</p> <p>9 strength of the human evidence really, to</p> <p>10 say that the group 1 classification was</p> <p>11 based on sufficient evidence in humans and</p> <p>12 I don't think that's correct. Whether</p> <p>13 dioxin is carcinogenic in general, that's</p> <p>14 not really what I was focusing on.</p> <p>15 Q. You were focused on the human</p> <p>16 epidemiology?</p> <p>17 A. That's correct.</p> <p>18 Q. And your opinion is that the</p> <p>19 human epidemiology does not support dioxin</p> <p>20 as a known human carcinogen?</p> <p>21 A. Exactly, in this source.</p> <p>22 Q. And that paper was published</p> <p>23 around 2011 or the beginning of 2012?</p> <p>24 A. Possibly, I don't remember.</p> <p>25 Q. Is dioxin still classified today</p>	<p>1 A. No, it was only on cancer.</p> <p>2 Q. Only on cancer.</p> <p>3 A. It was not on Parkinson's.</p> <p>4 Q. I'm confusing it with a different</p> <p>5 paper. That paper concluded that atrazine</p> <p>6 did not cause an increased risk of cancer?</p> <p>7 A. Correct.</p> <p>8 Q. And you were paid around \$20</p> <p>9 thousand for that work?</p> <p>10 A. That's possible. Again, I don't</p> <p>11 remember the figures. I don't know where</p> <p>12 you get them, but I don't remember.</p> <p>13 Q. If you testified to that in the</p> <p>14 past, you wouldn't disavow that testimony</p> <p>15 today, that you were paid \$20 thousand for</p> <p>16 your work on that paper?</p> <p>17 A. I think I should go back and</p> <p>18 check my invoices. I mean, I don't</p> <p>19 remember the exact amount.</p> <p>20 Q. Well, okay, do you recall</p> <p>21 being --</p> <p>22 A. Yeah, paid some money.</p> <p>23 Q. Alright. Exponent consultants</p> <p>24 were also involved in publishing a paper</p> <p>25 rating to asbestos exposure and the risk of</p>
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<p>1 an a known human carcinogen by IARC?</p> <p>2 A. Yes. I don't think they</p> <p>3 downgrade any agent ever.</p> <p>4 Q. So did you submit your paper to</p> <p>5 IARC or at least bring it to their</p> <p>6 attention?</p> <p>7 A. No.</p> <p>8 Q. You were paid about \$20 thousand</p> <p>9 for that paper?</p> <p>10 A. That's possible, yes. I don't</p> <p>11 remember.</p> <p>12 Q. Who funded that paper? Did</p> <p>13 Exponent pay you directly or did some</p> <p>14 company that made dioxin?</p> <p>15 A. I suppose some of the companies,</p> <p>16 but I was only involved with the people</p> <p>17 from Exponent.</p> <p>18 Q. Another paper you published as an</p> <p>19 Exponent consultant was on atrazine?</p> <p>20 A. Yes, that's correct.</p> <p>21 Q. Atrazine is a pesticide?</p> <p>22 A. Yes, a herbicide.</p> <p>23 Q. And that paper concluded that</p> <p>24 exposure to atrazine doesn't cause</p> <p>25 Parkinson's Disease?</p>	<p>1 mesothelioma in automobile mechanics,</p> <p>2 correct?</p> <p>3 A. No, I don't remember this, sorry.</p> <p>4 Which paper do you refer to?</p> <p>5 Q. Weren't you a co-author with</p> <p>6 David Garabrant and several others?</p> <p>7 A. Oh, sure, yes. It was done with</p> <p>8 David Garabrant and was -- yeah, was not</p> <p>9 part of a consultancy with anybody.</p> <p>10 Q. You recognize that some of the</p> <p>11 authors of that paper were Exponent</p> <p>12 scientists, correct?</p> <p>13 A. Probably, yes.</p> <p>14 Q. Were you compensated in any way</p> <p>15 for your work on the 2015 Goodman paper</p> <p>16 with Garabrant?</p> <p>17 A. No.</p> <p>18 Q. How did you come to be involved</p> <p>19 in that paper?</p> <p>20 A. I know David Garabrant for</p> <p>21 20 years or more or whatever, so he asked</p> <p>22 me whether I wanted to be involved in that</p> <p>23 paper.</p> <p>24 Q. And is it your opinion that</p> <p>25 asbestos exposure from brakes cannot cause</p>

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<p>1 mesothelioma in humans?</p> <p>2 A. Well, I think the bottom line of</p> <p>3 our review was that there was no evidence</p> <p>4 that it causes. Again, it's the difference</p> <p>5 between hazard and risk. I mean, not all</p> <p>6 possible situations of exposure to asbestos</p> <p>7 would result in a minimum of risk. So</p> <p>8 that's definitely the case for the studies</p> <p>9 of auto mechanics or whatever.</p> <p>10 Q. So let me just see if I</p> <p>11 understand this correctly. It's not your</p> <p>12 opinion that fibrous asbestos that comes</p> <p>13 out of brakes is somehow magically</p> <p>14 transformed so that it's no longer</p> <p>15 carcinogenic, it is your opinion that the</p> <p>16 epidemiological evidence as it relates to</p> <p>17 automobile mechanics does not show an</p> <p>18 increased risk of mesothelioma?</p> <p>19 A. Yes, that's correct.</p> <p>20 (Exhibit 26, Article from</p> <p>21 RightOnCanada.ca, marked for</p> <p>22 identification.)</p> <p>23 (Exhibit 27, Email chain dated</p> <p>24 November 11 and 12, 2015, and</p> <p>25 attachments, marked for</p>	<p>1 candidacy, you got the job, and then you</p> <p>2 decided not to take the job?</p> <p>3 A. Before -- it was a job with a</p> <p>4 starting date, and before the starting date</p> <p>5 I decided I was no longer willing to take</p> <p>6 the job.</p> <p>7 Q. Okay, why did you decide that?</p> <p>8 A. Well, because there were all</p> <p>9 these attacks related to this paper that I</p> <p>10 published with Carlo La Vecchia.</p> <p>11 Q. Oh, the stopping exposure paper?</p> <p>12 A. Yeah, there was another</p> <p>13 candidate, internal candidate, they tried</p> <p>14 to kill my candidacy from the very</p> <p>15 beginning, and then they threw up all this,</p> <p>16 you know, false, you know, things to try to</p> <p>17 kill me. So at some point they found this</p> <p>18 story of the asbestos paper, that they made</p> <p>19 up all this big story, so I decided that I</p> <p>20 didn't want to work in a place where there</p> <p>21 were people doing this sort of thing, so I</p> <p>22 withdrew. Better to withdraw before than,</p> <p>23 you know, after you are on the job.</p> <p>24 Q. And you stayed, you decided to</p> <p>25 stay here in the United States working for</p>
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<p>1 identification.)</p> <p>2 Q. Alright, 26 is an</p> <p>3 article published -- I'm not going to ask</p> <p>4 you to read the article, but it just --</p> <p>5 it's an article published in a journal</p> <p>6 called RightOnCanada and it references</p> <p>7 Dr. Paolo Boffetta withdraws his candidacy</p> <p>8 as Director of France's leading</p> <p>9 epidemiology center. My first question,</p> <p>10 sir, is did you ever apply to be the</p> <p>11 Director of France's leading epidemiology</p> <p>12 center?</p> <p>13 A. Well, whether it's a leading</p> <p>14 center, I don't know. I applied to be</p> <p>15 Director of this particular center called</p> <p>16 the CESP.</p> <p>17 Q. And did you later withdraw your</p> <p>18 candidacy?</p> <p>19 A. No, this is not correct. I was</p> <p>20 offered the job, I accepted the job and</p> <p>21 then I withdrew my acceptance, or I stepped</p> <p>22 down or whatever, step out, before the term</p> <p>23 started. So it's a big difference from</p> <p>24 withdrawing.</p> <p>25 Q. You didn't withdraw your</p>	<p>1 the Tisch Cancer Center at Mount Sinai?</p> <p>2 A. For Mount Sinai, yes.</p> <p>3 Q. And you've been here for what,</p> <p>4 eight years now?</p> <p>5 A. Yes, I think so.</p> <p>6 Q. Do you like living in New York</p> <p>7 City?</p> <p>8 A. Yes, I do.</p> <p>9 Q. Do you make it home to Italy</p> <p>10 frequently?</p> <p>11 A. Yeah, I go to Italy every now and</p> <p>12 then if I can.</p> <p>13 Q. Exhibit 27 is -- do you recall</p> <p>14 receiving this email from Christian Hartley</p> <p>15 about the paper that you co-authored?</p> <p>16 A. I vaguely remember, but I don't</p> <p>17 think I replied or whatever. I mean, I</p> <p>18 didn't consider this was very important, I</p> <p>19 mean frankly.</p> <p>20 Q. It wasn't important to you</p> <p>21 that --</p> <p>22 A. I think it was related to some</p> <p>23 litigation or whatever. And as I said, I</p> <p>24 participated in this review paper as a, you</p> <p>25 know, just as a scientific piece of work.</p>



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<p>1 I mean, I had nothing to do with any 2 litigation or any consultancy or anything, 3 so I didn't know why these people were 4 trying to bring me into this story. 5 Q. So you weren't -- 6 A. And in fact I was a little bit 7 surprised, because after I replied to this 8 person, I got -- I was copied in a number 9 of replies of people who were not in the 10 list that I saw. So he put a lot of people 11 in blind cc and these people were then 12 replying to each other. So I was really 13 very, very annoyed of this email. That's 14 why I decided not to reply and drop the 15 whole thing completely. 16 Q. Okay, so it wasn't important to 17 you that prior to becoming a defendant, a 18 significant defendant in asbestos 19 litigation, that Ford and General Motors 20 and Chrysler had gone out and spent 21 \$30 million to hire Dennis Paustenbach, an 22 Exponent chemist, to attempt to create a 23 defense in asbestos cases. That was not 24 material to you in any way in deciding to 25 work with Exponent scientists on a paper</p>	<p>1 enlisted scientists to help defend itself 2 in asbestos litigation? 3 A. Yes. 4 Q. Have you ever met with or spoken 5 on the telephone with a lawyer named Bruce 6 Bishop? 7 A. Bruce Bishop, yes, in the far 8 past, many years ago. 9 Q. How did you come to meet and talk 10 to Mr. Bishop? 11 A. I think at some point he was 12 contacting me, whether I wanted to be 13 involved in some asbestos litigation or 14 whatever and I said basically that I was 15 not interested. So I think I met him once 16 or whatever. 17 Q. When was that? 18 A. Oh, many years ago, maybe 2012, 19 2011, I don't remember. And then I met him 20 again last, two years ago, last year, I 21 attended one of these mesothelioma 22 conferences and he was there I remember. 23 So I just said hello to him. 24 Q. Has he asked you to testify or 25 consult on asbestos cases in the past two</p>
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<p>1 relating to brakes in asbestos exposure? 2 MR. McGUFFEY: Object to form. 3 A. As I said, my contact for that 4 paper was David Garabrant, and I think he's 5 in that forum. Second, I was not aware of 6 this story with Ford or whatever about 7 their asbestos litigations in the past. I 8 understand there is litigation going on on 9 this asbestos brake and the car, automobile 10 thing. As I said, I was never involved. I 11 was not involved in this meta-analysis, so 12 I didn't think it was a fair thing to try 13 to bring me in this, especially with this 14 sort, you know, sneaky way, because he sent 15 me first a message very general, very 16 neutral, and then when I replied he send me 17 all this stuff putting all these people in 18 blind cc, blind cc, whatever it states, so 19 I think it was very inappropriate I would 20 say. 21 Q. Okay, so you don't like the way 22 Mr. Hartley corresponded with you, and you 23 -- is it fair to say you did not consider 24 the materials he sent you as important in 25 analyzing the way in which Ford had</p>	<p>1 years? 2 A. No. As I said, I saw him only 3 once maybe in the last seven or eight 4 years. 5 Q. Has Mr. Bishop ever asked you to 6 comment on any published literature or to 7 write any published literature relating to 8 asbestos in any way? 9 A. No. No, I didn't do any work 10 with him really. 11 Q. Do you know the relationship that 12 David Garabrant has with Bruce Bishop? 13 A. No, I don't. 14 Q. Do you know that David Garabrant 15 has been paid millions of dollars by Bruce 16 Bishop's clients in asbestos litigation? 17 A. I don't know this. 18 Q. Would it surprise you to learn 19 that? 20 A. Millions of dollars? 21 Q. Yes. 22 A. Sure, it would surprise me a 23 little bit. Whether David did asbestos 24 work, I don't know, but as I understand, it 25 would be understandable. Whether he was</p>

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<p>1 paid millions of dollars, it would surprise 2 me a little bit, yes. 3 Q. Okay, it would surprise you to 4 learn that David Garabrant has been paid 5 millions of dollars over the past 15 years 6 to testify for asbestos car companies and 7 brake companies in asbestos litigation, 8 that would surprise you? 9 A. Yes, sure. 10 Q. Would that cause you to question 11 his objectivity as it relates to those 12 types of issues? 13 A. Well, maybe, I don't know. I 14 have to think about this. But I can tell 15 you that for the meta-analysis we 16 published, you know, when it was -- 17 Q. 2015? 18 A. Yeah, three years ago, I did not 19 receive any, how can I say, any type of -- 20 I was totally free to, you know, add my 21 comments and do my piece of work, you know, 22 helping with the analysis. I didn't have 23 any pressure or any -- I didn't feel any 24 sort of guidance to go one direction or the 25 other. So that's what I can say.</p>	<p>1 Q. And there hasn't been any 2 mesotheliomas in that cohort so far? 3 A. No, there's been no mesothelioma 4 there. 5 Q. If a mesothelioma were to develop 6 out of that cohort, would you agree with me 7 that would be evidence of an increased risk 8 of mesothelioma from working in that mine? 9 MR. McGUFFEY: Objection to 10 form, foundation. 11 A. Probably, yes, I don't know. 12 Maybe -- well, one has to look whether this 13 person maybe worked in the mine for -- 14 Q. Six months and then went off and 15 worked -- 16 A. Yeah. 17 Q. Okay, I understand that. Leaving 18 that aside, but if a cohort study of, let's 19 say, less than a thousand miners at a talc 20 mine shows no mesotheliomas for a 21 significant period of time, but then a 22 mesothelioma for someone who was clearly in 23 that cohort arises, that would be evidence 24 of a -- 25 A. Well, it would be suggestive,</p>
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<p>1 Q. Alright, we're almost to 1:20 2 here. Three more minutes of questions. 3 Did you ever have any 4 communications or contacts with the R.T. 5 Vanderbilt Company in upstate New York? 6 They run a talc mine there. 7 A. No, I don't think so. 8 Q. Have they ever asked you to do 9 any epidemiology related to exposure to 10 talc which is contaminated with tremolite? 11 A. No. I know the studies, but no, 12 I've never been involved in those in any 13 way. 14 Q. Okay, what about the Val Chisone 15 mine in Italy? Have you done work? 16 A. Val Chisone? 17 Q. Val Chisone. 18 A. Oh, yes, I was one of the authors 19 of the update of the mortality study. 20 Q. The update of the epidemiology 21 study, and that was a cohort of about a 22 thousand miners? 23 A. Two thousand. One thousand now 24 have died, and one thousand are still alive 25 if I remember, maybe a bit less.</p>	<p>1 yeah, but as I said, one should look at a 2 number of other factors, yes, for sure. 3 MR. FINCH: That's all the 4 questions I have at this time, because 5 my four hours are up and your four 6 hours are up. I believe counsel for 7 Weyerhaeuser has about four hours of 8 questions for you, so let's just see 9 if you can get them done in five 10 minutes. 11 (Recess taken: 1:22-1:26 p.m.) 12 EXAMINATION BY MR. McGUFFEY: 13 Q. Dr. Boffetta, if we could, go 14 ahead and grab Exhibit 16, which is 15 Rodelsperger article. I'd like to ask a 16 question that's not about that as soon as 17 you get it, and then I'll ask a question 18 about that. 19 A. Okay. 20 Q. Alright, so earlier today you 21 were asked about a different paper, it was 22 by Wagner in 1960 that looked at African 23 asbestos mines, or South African asbestos 24 mines, correct? 25 A. Yes.</p>

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<p style="text-align: right;">Page 178</p> <p>1 Q. Do you recall what type of 2 asbestos was being mined there? 3 A. Well, I think it was mainly 4 amphiboles, but there is also mining of 5 chrysotile, but I don't think the Wagner 6 report was on those. There have been 7 studies on chrysotile workers, but these 8 were done later on. 9 Q. The Wagner study is a case study 10 that observed a certain number of -- a 11 certain number of cases of mesothelioma, 12 but that study did not attempt to estimate 13 the risk of living near the mine, working 14 at the mine, or living with the person who 15 worked at the mine, correct? 16 A. Yes, that's correct, it was a 17 supported case report, so it was a report 18 of a few cases, yes. 19 Q. Do you recall the first study 20 that attempted to estimate risk of 21 mesothelioma from asbestos exposure? 22 A. No, I don't remember the very 23 first time. Obviously the studies in 24 England and the US were among the first 25 studies, and I don't remember which were</p>	<p style="text-align: right;">Page 180</p> <p>1 this study did anything to estimate 2 non-occupational exposure. 3 Q. I agree with that. My question 4 is simply even looking at this study, if a 5 person has a greater than 15 fibers per cc 6 years, do we know what the additional 7 contribution of another .15 fibers per cc 8 years would be to their risk profile? 9 A. Well, obviously not from this 10 study, or in general I think not from any 11 other study. As I said before, I don't 12 think community exposure is the right 13 way to calculate the risk for mesothelioma. 14 And also I think this study is flawed at 15 least in part. But anyway, the answer is 16 yes. 17 Q. Fair enough. And hopefully I 18 will be able to ask these without us going 19 back and looking particularly, but earlier 20 today you were asked about measurements 21 taken by a Weyerhaeuser employee at various 22 cities throughout Wisconsin, correct? 23 A. Yes, correct. 24 Q. That's Exhibit 9 if you want to 25 see it, but I'll ask a general question.</p>
<p style="text-align: right;">Page 179</p> <p>1 the first studies now. 2 Q. Alright. Turning to the 3 Rodelsperger paper, if you could, look at 4 table 7 on 269. 5 A. Yes. 6 Q. And this is what we were looking 7 at earlier, correct? 8 A. Yes. 9 Q. And you were asked questions 10 about the odds ratios resulting from 11 asbestos exposures greater than zero but 12 less than .15 fibers per cc, correct? 13 A. Yes, correct. 14 Q. This actually goes up to 15 exposures starting at 15 fibers per cc or 16 greater, correct? Fibers per cc years. 17 A. The top category case. 18 Q. Do you agree with me that this 19 does not show the additional risk from an 20 exposure greater than zero, but less than 21 .15 fibers per cc years when combined with 22 high exposures from a second source? 23 MR. FINCH: Form. 24 A. Well, my understanding is these are 25 all occupational exposures. I don't think</p>	<p style="text-align: right;">Page 181</p> <p>1 Do you know what the analytical method was 2 that was used for those samples? 3 A. Well, if I remember, this was TM 4 I think, if that's correct. Now I need to 5 go back and check this. Yes, face contrast 6 microscopy, yes. 7 Q. PCM, correct? 8 A. PCM. 9 Q. And then were you asked to look 10 at ATSDR's and the toxicological profile, 11 correct? 12 A. Yes. 13 Q. And if you could turn in actually 14 the other one, if you could turn to page 15 149 that we were looking at earlier, 16 towards the bottom, and you agree with me 17 that when it says, "Concentrations of 18 asbestos fibers in outdoor air are highly 19 variable, ranging from below .1" nanogram 20 per cubic meter, and then it provides an 21 equivalency for PCM, correct? 22 A. Yes, that's correct. 23 Q. Do you have any information on 24 how that conversion was calculated? 25 A. Not for this particular study. I</p>

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<p style="text-align: right;">Page 182</p> <p>1 should go back and check this. But I know 2 that this has always been a mess, I mean, a 3 complicated matter to transform gravimetric 4 measurements, you know, grams per cubic 5 meter, nanograms, into fiber counts. 6 Q. Are you going to offer an opinion 7 on that conversion in this case? 8 A. Not really. But as I said, it's 9 hard to -- when measurements are on PCM, 10 are based on gravimetric data, one has 11 always to keep, you know, to use some 12 caution in interpreting the data. That's 13 what I would say. 14 Q. As a general medical or 15 scientific principle, it's better to 16 compare something measured by the same 17 analytical method one to the other, 18 correct? 19 A. Obviously, and PCM has been 20 standard. 21 Q. When you were asked earlier about 22 your work with David Garabrant, in 23 particular the 2015 study that you 24 published with him, and Goodman may be the 25 lead author, did you review the data, or</p>	<p style="text-align: right;">Page 184</p> <p>1 page 16 and 17, earlier there was marked a 2 study by Ferrante, but we actually didn't 3 mark this Maule study from 2007. Am I 4 correct that this is the study that served 5 as the basis for -- or that provided the 6 data that allowed you to comment on 7 residential distance for occupationally 8 exposed workers? 9 A. Yes, this is the study I used for 10 the residential exposure, that's correct. 11 Q. Maule 2007? 12 A. Maule 2007. 13 Q. And the Ferrante study that was 14 marked earlier is the one that you used the 15 data to be able to comment on the impact of 16 household exposures for occupationally 17 exposed people, correct? 18 A. Yes, exactly. 19 Q. And just to be clear, on page 27 20 and 28, looking at Maule, your conclusion 21 was that residential exposure is relevant 22 to subjects without occupational exposure, 23 but add essentially no risk to occupational 24 exposed subjects, correct? 25 A. Well, my re-analysis of the data</p>
<p style="text-align: right;">Page 183</p> <p>1 what was your contribution to the paper? 2 A. Well, I was one of the people 3 involved in the meta-analysis, so we 4 selected a study and reviewed the study and 5 then we abstracted the data. This was done 6 by several people and then we confronted 7 our results, whatever we derived from the 8 study to make sure that, you know, we 9 included in the meta-analysis the best 10 possible data. 11 Q. And you did that work yourself, 12 correct? 13 A. Yes, and then we had a telephone 14 conference where, you know, we were 15 exchanging, you know, I was commenting 16 where, you know, I thought it was, you 17 know, it sounded right or some other data 18 to use or whatever. 19 Q. Did you ever feel like you were 20 being ignored or marginalized during that 21 process? 22 A. No. As I said before, I didn't 23 feel any pressure when doing these studies. 24 Q. If you could turn to Exhibit 3, 25 that's your report. If you could turn to</p>	<p style="text-align: right;">Page 185</p> <p>1 from the Maule study which are in table 2 2 show that there is no association between 3 residential exposure and mesothelioma risk 4 in those with minimal occupational 5 exposure. 6 Q. And similarly, looking at the data 7 from Ferrante, the conclusion was household 8 exposure is relevant for subjects without 9 occupational exposure, but add essentially 10 no risk to occupationally exposed subjects, 11 correct? 12 A. Yes. Again, my re-analysis of the 13 data from the Ferrante study show that there 14 is no association between household exposure 15 as it was defined in that study, and 16 mesothelioma risk in people with 17 occupational exposure. 18 Q. So I just wanted to ask something 19 that was talked about earlier. It had to 20 do with hazard, you mentioned hazard versus 21 risk. So if you could just tell me the 22 difference. 23 A. Yes, hazard in my understanding 24 is the inherent ability of an agent to 25 cause an effect on a biological system such</p>

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<p>1 as causing cancer, for example. Risk is the 2 probability that this effect occurs in a 3 given exposure situation, a given exposure 4 circumstance. So those are two very 5 different concepts. 6 Q. So in my own terminology, would 7 you agree with me that hazard essentially 8 represents what might be called a general 9 causation meaning that, for example, asbestos 10 from any particular source causes 11 mesothelioma? 12 A. I'm not sure I would link hazard 13 and risk to this general causation story. 14 General causation to me comes from -- well, 15 in a way perhaps yes, it's a hazard 16 indication in the sense that an agent in 17 principle is able to cause an effect. This 18 is what we call general causation, but 19 that's okay. But it's not the way I think. 20 Q. Just because you have a hazard, 21 something capable of causing a disease, 22 does not mean that it actually increases -- 23 that all exposures to that hazard increase 24 risk, correct? 25 A. Yeah, that's what I was trying to</p>	<p>1 MR. McGUFFEY: That's all I've 2 got. 3 EXAMINATION BY MR. MR. FINCH: 4 Q. Two follow-ups based on that. In 5 doing that disentangling that you applied 6 your expert judgment to, how to analyze the 7 Casale paper, the Casale source of exposure 8 and the Maule paper, correct? 9 A. Well, what I did, I derived the 10 numbers of cases and controls with a 11 different combination of occupational and 12 residential or household exposure from the 13 tables reported in these two papers, Maule 14 2007 for residential and Ferrante 2016 for 15 household. And then I calculated both 16 ratios in the normal way epidemiologists do, 17 on the overall, which is what basically 18 they published, and then in those with 19 occupational exposure and those without 20 occupational exposure. 21 Q. Okay, but the first step in that, 22 you applied your expert judgment to say 23 this is what I should do to analyze these 24 two papers, correct? 25 A. Yes, I applied the standard</p>
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<p>1 say. 2 Q. And from your review of the 3 literature, the only studies that provide 4 the data actually show that for 5 occupationally exposed people there is no 6 increased risk for community or 7 environmental exposure, correct? 8 A. These are the two studies from 9 Casale. Well, based on the review I did, 10 yes. Probably there are other studies that 11 would have this data available, but they 12 were not reported in a way that one can 13 disentangle the two. 14 Q. From the information that we 15 have -- 16 A. From the published data, those 17 are the only two I was able to separate the 18 two. 19 Q. And the same is true based on the 20 data that we have from the studies that we 21 have, for occupationally exposed people 22 there is no increased risk from household 23 exposures, correct? 24 A. Yeah, based on the other study 25 from Casale, yes.</p>	<p>1 method. I mean, you can correct my expert 2 judgment in using the standard method for 3 epidemiologies. 4 Q. And of all the studies that have 5 been published that show an increased risk 6 of mesothelioma from non-occupational 7 exposure, whether it's domestic or 8 neighborhood, there were only two that had 9 data that allowed you to do -- to attempt 10 to do this disentanglement, correct? 11 A. Yes, this is what I was trying, 12 one for residential exposure and one for 13 household exposure. 14 MR. FINCH: That's all I have. 15 Thank you, doctor. 16 (Time noted: 1:45 p.m.) 17 18 19 20 21 22 23 24 25</p>

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Page 190	Page 192
1           A C K N O W L E D G M E N T	1           E R R A T A
2	2   PAGE LINE EMENDATION
3   STATE OF NEW YORK   )	3   _____
4                       : ss	4   _____
5   COUNTY OF           )	5   _____
6	6   _____
7           I, PAOLO BOFFETTA, M.D., hereby	7   _____
8   certify that I have read the transcript of	8   _____
9   my testimony taken under oath in my	9   _____
10   deposition of February 6, 2018; that the	10   _____
11   transcript is a true, complete and correct	11   _____
12   record of my testimony, and that the	12   _____
13   answers on the record as given by me are	13   _____
14   true and correct.	14   _____
15	15   _____
16	16   _____
17 <u>PAOLO BOFFETTA, M.D.</u>	17   _____
18	18 <u>Signature of Deponent</u>
19   Signed and subscribed to before	19   SUBSCRIBED AND SWORN BEFORE ME
20   me, this           day	20   THIS ____ DAY OF _____, 2018.
21   of                       , 2018.	21   _____
22	22   _____
23	23   _____
24 <u>Notary Public, State of New York</u>	24   (Notary Public)
25	25   MY COMMISSION EXPIRES: _____
Page 191	Page 193
1           C E R T I F I C A T E	1           I N D E X
2	2
3   STATE OF NEW YORK   )	3   EXAMINATION:
4                       ) ss.:	4   BY MR. FINCH                       4
5   COUNTY OF NEW YORK   )	5   BY MR. MR. FINCH               188
6	6
7           I, DAVID HENRY, a Notary Public within	7
8   and for the State of New York, do hereby	8   EXHIBITS
9   certify:	9   Exhibit 1, Notice of Deposition   6
10   That PAOLO BOFFETTA, M.D., the witness	10   Exhibit 2, Subpoena               6
11   whose deposition is hereinbefore set forth,	11   Exhibit 3, Export Report of       10
12   was duly sworn by me and that such	12   Paolo Boffetta
13   deposition is a true record of the	13   Exhibit 4, Curriculum Vitae of   13
14   testimony given by such witness.	14   Paolo Boffetta
15   I further certify that I am not	15   Exhibit 5, List of trial and       21
16   related to any of the parties to this	16   deposition testimony
17   action by blood or marriage; and that I am	17   Exhibit 6, Invoice dated January   21
18   in no way interested in the outcome of this	18   8, 2018
19   matter.	19   Exhibit 7, Summary of Kilty case   44
20   IN WITNESS WHEREOF, I have hereunto	20   Exhibit 8, Summary of Spatz case   44
21   set my hand this 12th day of February,	21   Exhibit 9, Research Report dated   68
22   2018.	22   12/5/84
23	23   Exhibit 10, Research Report of   68
24 <u>DAVID HENRY</u>	24   Joseph Wendlick dated August,
25	25   1985

49 (Pages 190 to 193)

Paolo Boffetta, M.D.

<p style="text-align: right;">Page 194</p> <p>1 Exhibit 11, Report entitled 69  2 Toxicological Profile for  3 Asbestos  4 Exhibit 12, ATSDR Report dated 69  5 September, 2001  6 Exhibit 13, Article by Paolo 82  7 Boffetta in Med Lav 1998; 89,  8 6:471-480  9 Exhibit 13A, Lined sheet with 90  10 handwriting  11 Exhibit 14, 2012 British Journal 99  12 of Cancer Article by McCormack,  13 Peto et al.,  14 Exhibit 15, 2013 British Journal 99  15 of Cancer Letter to the Editor  16 Exhibit 16, Rodelsperger, et al. 114  17 Article in American Journal of  18 Industrial Medicine  19 Exhibit 17, Lacourt, et al. 114  20 Article from Thorax Online  21 Exhibit 18, Jiang, et al. 114  22 Article from BD Biosciences.com  23 Exhibit 19, Rake, et al. Article 127  24 on the British Journal of Cancer  25</p>	
<p style="text-align: right;">Page 195</p> <p>1 Exhibit 20, Marsh et al. Article 133  2 in Occupational Environmental  3 Medicine  4 Exhibit 20A, Ferrante et al. 138  5 Paper of 2015  6 Exhibit 21, Helsinki Criteria 140  7 paper  8 Exhibit 22, La Vecchia and 141  9 Boffetta article  10 Exhibit 22A, Response published 142  11 in American Journal of  12 Industrial Medicine  13 Exhibit 23, Erratum published in 145  14 European Journal of Cancer  15 Prevention, 2015, 24:68  16 Exhibit 24, Curriculum Vitae 149  17 Exhibit 24A, Lined sheet with 154  18 handwritten notations  19 Exhibit 25, Response to email 154  20 dated February 8, 2000  21 Exhibit 26, Article from 166  22 RightOnCanada.ca  23 Exhibit 27, Email chain dated 166  24 November 11 and 12, 2015, and  25 attachments</p>	

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